MUSIC, EMOTIONS AND INVESTMENT-RELATED RISK-TAKING BEHAVIOUR

GOH SHAW HENG

GOH KAH HONG

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE

REQUIREMENTS FOR THE BACHELOR OF SOCIAL SCIENCE (HONS)

PSYCHOLOGY FACULTY OF ARTS AND SOCIAL SCIENCE UNIVERSITI TUNKU

ABDUL RAHMAN

MAY 2019

Music, Emotions and Investment-related Risk-taking Behaviour

Goh Shaw Heng and Goh Kah Hong

Universiti Tunku Abdul Rahman

This research project is submitted in partial fulfilment of the requirements for the

Bachelor of Social Science (Hons) Psychology, Faculty of Arts and

Social Science, Universiti Tunku Abdul Rahman. Submitted on May 2019.

ACKNOWLEDGEMENTS

We would like to convey our deepest appreciation and sincere gratitude to the people who have helped us and provide their valuable assistance, guidance, and encouragement to complete this final year project.

First of all, we would like to convey our deepest gratitude to our supervisor, Dr Chie Qiu Ting for the journey of completing this report. She gave her advice, guidance and support throughout the study, as well as her tremendous effort in checking all the drafts to complete this study. This study would not be completed without her supervision.

We would also like to thank for all the participants who participated in our study. They had spent their time to participate in this study with full concentration and enthusiasm. This report would not be completed without their participation.

Furthermore, we appreciated the opportunity given by the university to us in learning and experiencing the process of conducting research in our final year of our Bachelor Degree of Social Science (HONS) in Psychology.

Finally, we apologized to all other unnamed individuals who helped us in this in various ways to complete this study.

Goh Shaw Heng

Goh Kah Hong

MUSIC, EMOTIONS AND INVESTMENT-RELATED RISK-TAKING
BEHAVIOUR

APPROVAL FORM

This research paper attached here, entitled "Music, Emotion and Investment-related

Risk-taking Behaviour" prepared and submitted by Goh Shaw Heng and Goh Kah

Hong, in partial fulfillment of the requirements for the Bachelor of Social Science

(Hons) Psychology is hereby accepted.

_____

Supervisor   Date:_____

(Dr. Chie Qiu Ting)

Abstract

The aim of this study is to find out whether happy and sad music will induce

emotion respectively, and whether different induced emotion will cause any

difference in making investment-related risk making decision. The time taken for

different induced emotion to make risky decision is also recorded. In this study, 120

participants from Universiti Tunku Abdul Rahman are recruited from several faculties.

They were randomly assigned into experimental conditions (happy or sad music) and

control (no music) and had to answer or perform (type of tasks) as part of the

quasi-experiment. The results in this study shows that happy music can induce happy

emotion and sad emotion can induce sad emotion. This found that induced emotion

did not significantly affect risky decision making. However, participants with sad

induced emotion use longer time to make risky investment decision than participants

with induced happy emotion. Negative emotion can slow down decision making

process, while happy emotion can cause shorter information processing further

process. Further studies are required to investigate the effect of emotion in making

risky decision. The present study can contribute in clinical study as a screening tool to

identify the impulsive behaviour and also increase the understanding of investors in

investment behaviour.

Keywords: induced emotions, risk-taking behaviour, time to make risky decisions

DECLARATION

We declare that the material contained in this paper is the end result of our own work

and that due acknowledgement has been given in the bibliography and references to

ALL sources be they printed, electronic or personal.

Name : GOH SHAW HENG

Student ID: 16AAB06335

Signed :

Date : 5th Aug 2019

Name : GOH KAH HONG

Student ID: 15AAB03581

Signed :

Date : 5th Aug 2019

Table of Contents

List of Tables

List of Abbreviations

AIM	Affective Infusion Model
ANOVA	Analysis of Variance
DOSPERT	Domain-Specific Risk-Taking Scale
FAS	Faculty of Arts and Social Sciences
FBF	Faculty of Business and Finance
FICT	Faculty of Information and Communication Technology
FSC	Faculty of Science
GEMS	Geneva Emotions Music Scale
IGT	Iowa Gambling Task
M	Mean
MMH	Mood Maintenance Hypothesis
MS	Mean Squares
n	Number of respondents
RCT	Rational Choice Theory
SD	Standard deviation
SPSS	Statistical Analysis Software
UTAR	Universiti Tunku Abdul Rahman
Tukey's HSD	Tukey's honestly significant difference

Chapter 1: Introduction

1.1 Background of Study

1.1.1 Definition and characteristics of music

Music is as an art of combining vocal or musical instrument (or both) to create beauty of form, harmony, and expression of emotion (Concise Oxford Dictionary, 1992). Music affects us in different ways that require psychological explanation, for example music can provide energy, tranquillity, inspiration and otherwise shapes our emotion (Thompson & Quinto, 2011). Happiness and sadness are two basic emotions that music can easily display (Krumhansl, 1997). Some characteristics of music are important elements for the listeners to determine the perception of happiness and sadness in the music. In music, scale is a series of notes in ascending or descending order that shows the pitches of key, starting and ending on the tonic of that key, while tempo is the speed of the beat in musical pieces (Pilhofer & Day, 2012). In Western music, musical pieces that are composed in fast tempo are perceived to sound happy, whereas sad-sounding music is slow in tempo (Peretz & Vieillard, 2008). Moreover, musical pieces that are composed in major scales are perceived as excited, happy, bring or martial, while musical pieces that are composed in minor scales are perceived as subdued, sad, dark or wistful (Hevner, 1935; Cooke, 1959; Crowder, 1984; Krumhansl, 1990; Gregory & Varney, 1996; Peretz, Gagnon, & Bouchard, 1998; Burkholder, Grout, & Palisca, 2005).

1.1.2 Classification and functions of emotion

Emotions can be classified into positive emotion, such as joy, love, interest and enthusiasm and negative emotion, such as sadness, anger, fear and anxiety (Fredrickson, 1998). These emotions serve different functions respectively. Positive emotions could

signal things that are going well for the individuals and enable it to broaden and build

their own resources for facing their problems and challenges ahead, while negative

emotions allow individuals to activate the physiological resources to react quickly in

dangerous situation. There are some evidences proving that negative emotions such as

sadness, fear, and anxiety may reduce the probability of making risky decision and anger

could increase the chance of making risky decision (Lerner & Keltner, 2001). Emotions

also help to prioritize things according to the value they allocate and they also require

behaviours or actions as their intrinsic characteristics (Mordka, 2016).

1.1.3 Definition and development of investment-related risk-taking behaviour

Irwin (1990) defines risk-taking behaviour from the decision-making perspective as

it is a determinant behaviour whose result is uncertain and probably the reason of

negative consequences. Risk-taking behaviour starts to increase during adolescence

period, when youngsters are involved in heightened reactivity to emotions and an

immature ability to self-regulate (Reniers, Murphy, Lin, Bartolomé, & Wood, 2016). An

investment is always believed to make benefits or profits making activity and is applied

to the financial markets (Hietanen, 2017). Nowadays, digital life has caused millennials

to be trapped in financial burdens (Asian Institute of Finance, 2015). Majority of youths

are dependent on personal loans, high cost borrowings and credit card borrowings (Asian

Institute of Finance, 2015). This condition has led us to understand that youngsters

nowadays are in a lot of debt and they must be aware and conscious of their own

behaviour if they intend to do any investment to reduce their debts in the future.

1.1.4 Music, emotion and investment-related risk-taking behaviour

Music shows an obvious effect (Coan & Allen, 2007) as it can affect the research setting without any acknowledgement from the participants themselves, thus representing real-life situations (Halko, Mäkelä, Nummenmaa, Hlushchuk, & Schürmann, 2015). Behen et al. (2011) showed participants happy and sad faces while they are listening to positive and negative music and the result shows that participants who heard the positive music rated the happy faces as more happy and their superior temporal gyrus were activated greater when the face and music were congruent with each other. The dominant theoretical model that explains risk for centuries was the expected utility model by Bernoulli (1954) and this model explains that decisions are made by assessing the desirability or expected utility of the probability of each outcome and weighting those utilities. However, von Neumann and Morgenstern (1947) proposed that people tends to maximize pleasure and minimize pain or losses. Hsee and Rottenstreich (2003) propose that regarding emotion in affecting risky decision making, individuals' decisions are guided by valuation of feelings which is the affective responses toward stimuli. Gabi and Zanotti (2010), found out that happy individuals tend to enter long positions and increase their financial leverage by using a virtual stock market game and record the participants' emotion. Ashton, Gerrard and Hudson (2003) found evidence of positive abnormal returns on the UK stork markets after the wins of England national team. Furthermore, Zhao (2006) conducted an experiment to investigate the effects of positive and negative emotions induced by a false-feedback test on risky decision making in a gambling task and he reported there is no significant difference between induced positive and negative emotion, and the time spent on the gambling task.

This study requires participants to be engaged in two different types of music, which are happy or sad song, to induce their emotion, and will also look into whether musical mood induction will cause the participants to be more involved in risky behaviour or not. The time taken for the risky decision will also be taken.

1.2 Problem Statement

Charles and Kasilingam (2015) suggested that emotion plays an important role in making investment decisions. The way investors use their emotions will bring them success or failure on their investment (Team of American Century Investments, 2012). The current stock market and empirical research done by Bashir, Azam, Butt, Javed and Tanvir (2013), stated that investors are not always as rational as they are meant to be. This phenomenon can be explained by behavioural finance as it explains several psychological factors could affect the investors' decision (Bakar & Ng, 2016). Even though emotion has an obvious effect in decision making of the investors, there are less research report regarding how emotion affects an investor's decision in investment and the harmful effects. Hence, it is important to be aware of the harmful effects that certain emotions may cause failure in their respective investment.

Furthermore, there are limited research regarding music, emotion and risk-taking behaviour among university students in our country, Malaysia. Most of the research that are related with this topic were done in Western countries. Therefore, most of the information about this study were retrieved from the Western countries. The related information retrieved for this study may not be applicable to other parts of the world due to the existence of social, cultural and economic differences. Thus, it is important to undergo a related study in our country to collect suitable information and data. This will

increase the reliability of the information, which are suitable to be used in Malaysia

context.

1.3 Research Objectives

1. To examine whether happy and sad music induce respective emotion among

undergraduates

2. To determine whether happy music will induce high risk-taking behaviour than sad

music.

3. To investigate the difference in time taken for induced positive and negative emotion

to make risky decision.

1.4 Research Questions

Research Question 1: Does happy and sad music induce the corresponding emotion

among undergraduates?

Research Question 2: Does the induced emotion affect risk-taking behaviour among

university students?

Research Question 3: Is there any difference in time taken for induced positive and

negative emotion to make risky decision?

1.5 Hypothesis

Hypothesis 1: Happy music will induce positive emotion, whereas sad music will induce

negative emotion in the participants.

Hypothesis 2: Participants in the happy music stimulation will make riskier decisions

compared to participants in the sad and neutral music conditions.

Hypothesis 3: There is no difference with participants in time taken to make risky

decisions between induced positive and negative emotions.

1.6 Significance of Study

This study will help to support the association between music, emotion and

risk-taking behaviour. There are numerous theories that argue about the association

between emotion and risk-taking behaviour. Theories like Affective Infusion Model

(AIM) and Mood Maintenance Hypothesis (MMH) have opposing views in supporting

whether happy emotion will cause the participants to be involved in higher risk-taking

behaviour. This study will help to further validate the theory used in this study.

This study will help the investor to be more aware of their emotion when they are

investing in any financial investment. This knowledge is also important for university

students if they intend to do any financial investment in their current situation or in the

future. In Malaysia, the growth of public and private universities will lead to the increase

in number of students who enrol in tertiary education, thus the number of students who

make loan debt to finance high education expenses will also increase (Ahmad, Mawar &

Ripain, 2018). Furthermore, the latest financial atmosphere also encourage youth to

borrow money even though it is not advisable for them to do so, because of the dynamic,

innovative and flexible credit policy, which will lead to more financial burden

(Kamaruddin & Mokhlis, 2003) . This will increase the financial burden of the student.

Investment is one of the way to help the students in reducing their financial debt. Hence,

the knowledge of emotion awareness in financial investment is important for them to be

more secured in financial investment.

1.7 Conceptual Definition

Risky Decision Making. Risky decisions making can be defined as a mental process

that is associated with interpretation and preference of goal-oriented alternatives when

consequences are ambiguous (Engelmann & Tamir, 2009)

Music. Music acts as an instrument for emotional communication without any

significant development (Pinker, 1994). Roederer (2012) stated that music can convey

pieces of emotional information to a group of people at the same time and stabilize

people's emotional state.

Emotion. Emotion is known as a direct and intense experience which is basically

caused by well-defined event or episode (Shelemay, 2006). Eisenberg and Spinrad (2004)

stated that emotion coordinates, influences and govern an individual's behaviour.

1.8 Operational definition

Music. Happy music can be specified as music with fast tempo, whereas sad

music can be portrayed as music with slow tempo.

Emotions. Emotions will be measured by showing cards with happy, sad and

neutral faces. This to investigate whether particular of music will evoke the

corresponding of emotions. With reference to past, happy emotions are denoted while fast

tempo music were listened by participant (Gabrielsson & Lindström, 2001), whereas sad

emotions are indicated with slow tempo music (Lundqvist, Carlsson, & Hilmersson,

2009). Neutral emotions are the indicators of no music conditions.

Risk-taking behaviour. Risk-taking behaviour can be measured by Iowa

Gambling Task (IGT) which present two options, high risk is the condition where greater

returns are received but accompanied with greater loss in long term. Low risk is the

condition where smaller returns are received with small loss also in long term.

Domain-Specific Risk-Taking (Adult) Scale (DOSPERT) – Risk Perceptions and

Risk-taking subscales will also be employed. The higher the scores, the higher the

perceptions of risk and risk-taking behaviour.

Chapter 2: Literature Review

This chapter reviews the relationships between music, emotions and risk-taking

behaviour in relation to investment decisions that have been done in past research studies.

This chapter also evaluates on the effects of different music arousals and tempi on the

types of emotion and decision making under risk. Besides, theories regarding music,

emotions and risk-taking behaviour are also discussed.

2.1 Music and Emotion

Parncutt (2014) suggested emotions (happy or sad) can be predicted by scales (major

or minor) and tempo of music presented. Research findings of Husain, Thompson and

Schellenberg (2002) show that manipulation of tempo could affect an individual's

emotional level, coupled with the feeling of enjoyment, expressions and astonishment.

Psychophysiological studies investigating the evocation of emotions with music by

Bartlett (1996), revealed that music with fast-tempo and high rhythm, which can be

categorized as high arousal music, is known to increase heart rate and muscle stiffness

which induced happy emotions, while music with slow tempo and dynamic, can be

categorized as low arousal music, decrease the heart rate and muscle stiffness which

induced sad emotions.

Music make use of the subsets of chromatic scale by categorizing each octave into

12 intervals according to the frequency ratio. The most common used subsets, diatonic

scales can be classified into two which are Ionian (major) and Aeolian (minor) scales.

Music which utilize the intervals of major scales is more likely to be recognized as

excited, vivacious, cheerful, while music utilize minor scale intervals will be perceived as

subdue, overwhelmed, depressed and longing (Burkholder et al, 2005; Aldwell and

Schachter, 2003). A study done by Katsner and Crowder (1990) stated that children who

listened to songs with major scales pointed more to happy faces as compared to those

with minor scales. Furthermore, research findings of Collier and Hubbard (2001) have

shown participants rated higher of perceived happiness with the exposure of ascending

major scales auditory stimuli than minor scale. This is due to the higher pitch height and

faster speed of major scales.

2.2 Music-induced Emotions and Investment-related Risk-taking Behaviour

According to the research done by Yuen and Lee (2003) with undergraduates, the

results showed that different induced-emotional states (positive, negative and neutral)

affected inclination of risk-taking that measured by "life dilemma task". The results

showed significant difference in risk-seeking preference with positive and negative

emotions, but no significant difference between neutral and positive emotions. This can

be supported by past research which found that investors with favourable emotions tend

to judge the risk as lower and with high gains while investors with unfavourable emotions

would regard risk as higher and with small gains (Slovic, Finucane, Peters, & MacGregor,

2004; Schunk & Betsch, 2006). The findings were consistent with research done by Chou

and Lee (2007), which revealed that people with positive mood preferred to take more

risk than others with negative mood regardless of age (young and old). Past research

finding (Dreman, Johnson, MacGregor & Slovic, 2001) showed that the risk and benefit

perceptions of investors were in line with their feelings. Research findings done by

Sobkow, Traczyk and Zaleskiewicz (2016) supported participants with sad mood would

form mental image or visualize the undesirable risk outcomes and exert impact on the

inclination of involvement in the risk-taking behaviour.

However, other researchers argued that people with positive emotions can be hesitant or unwilling to take risks as it will reduce their pleasurable emotional state (Hockey, Maule, Clough, & Bdzola, 2000; Lerner & Keltner, 2001; Wang, Liu, & Bi, 2010). In contrast, people who experience negative emotions are more inclined to take risks due to the substitution of unpleasant emotional state with more pleasurable emotions (Raghunathanaf & Pham, 1999). This can be supported by a past study (Zhao, 2006) which used gambling task, to show that individuals with positive mood were more inclined to choose lower-risk deck that involved in higher possibility to win and lower possibility to lose even though the return was small. In contrary, individuals with negative mood favored higher-risk decks which involved in higher possibility to lose but with greater return. Experimental study done by Drichoutis and Nayga (2013) showed that both positive and negative emotional states induced risk avoidance behaviour. The inconsistency and discrepancy of the past studies' results indicated that further examination should be done in present study.

Schulreich et al. (2004) presented that the differences of music (happy, sad and no music) and induced emotions were significantly correlated with risky decision making. In this study, undergraduates in Berlin with positive music-induced affect, were more willing to select the riskier lotteries in lottery-choice task. Students with music-induced negative emotions tend to select low risk lotteries than those in control group. This is due to the sensitivity of arousal with regard to corresponding affective stimuli which influenced individual with happy feelings became more liable to risk (Peng, Miao, & Xiao, 2013). According to research done by Au, Chan, Wang and Vertinsky (2003) indicated that investors or traders with positive emotions by exposing to music tend to

show less risk-seeking behaviour, whereas those with negative emotions performed more

accurate and pessimistic in their judgment and decision which in turn lead to higher profit

in financial trading process than in neutral and positive emotional states. By referring to

UK stock market from Ashton, Gerrard, and Hudson (2003), people with positive mood

will be more likely to have tendency to make investment in those risky assets and with

higher financial leverage. Some studies (Yuan, Zheng & Zhu, 2006; Kaplanski, Levy &

Scopus, 2009) suggested that investor with negative mood has displayed the reaction

towards stock market which corresponding to mood. Furthermore, participants with

happy emotions who involved in the virtual stock market experiment have higher

inclination to enter long term investment and expand their monetary leverage (Grable and

Roszkowski, 2008; Gabbi and Zanotti, 2010).

There are extensive studies regarding decision making by cognitive neuroscience

researchers. Nevertheless, those studies had limitations with distinguishing abnormal

decision making process (Schonberg, Fox, & Poldrack, 2011) . According to Moeller,

Barratt, Dougherty, Schmitz, and Swann (2001), impulsive behaviour in medical field

can be described by rapid decision making in risk before the information needed is

accessible (Clark, Robbins, Ersche, & Sahakian, 2006) without concerning the outcomes.

It plays significant role in clinical study as it affects individual's physical conditions or

well-being and even routine tasks in life (Herman, Critchley, & Duka, 2018). However,

limited past research (Zhao, 2006) have been done on time taken for risky decision

making with the effect of emotions, which leads to further examine and explore this topic

in the current study.

A lot of past research studies were done with university students and were conducted in Western countries (Colasante et al., 2017; Palazzi et al., 2018; Schulreich et al., 2014). There are limited studies regarding risk-taking behaviour, associated with music and emotions done in Asian countries. Hence, it is crucial to further examine about this topic among young adults in Asian cultures. Therefore, based on understanding from the aforementioned past studies, the current study is conducted with the hypotheses and assumptions that happy and sad music induce the corresponding emotion and in consequence the induced emotion associated with risk-taking behaviour. As referring to Du, Li., & Du (2014), the validation of DOSPERT used among Chinese undergraduate students in China to test their risk attitude and risk taking behaviours has been done. The results showed that it was valid and reliable to be used in China or even Asian culture. According to study done by Zhao (2006), there was no significant difference found between the induced positive and negative emotions in time taken for gambling task.

2.3 Theoretical background

The current study is driven by two theories, which are Walton's and Levinson's Aesthetic Theory and Affect Infusion Theory (AIM). The third theory, mood-maintenance hypothesis (MMH) is included as it suggests contrasting views to the previous two theories and may be applicable to the study if contrasting findings are found in the current experiment.

2.3.1 Walton's and Levinson's Aesthetic Theory

Walton (1988) revealed that music can be characterized as an expressive instrument, which people can imagine themselves to conduct self-analysis and being aware of their own individual emotions. It was proposed that music express individuals'

emotions by eliciting particular imaginative emotional experiences. For instance, people

will imagine "their authentic introspective consciousness connected with musical

sensations" as awareness of their mental conditions. Music listeners will imagine the

experiencing and classifying of specific feelings, and sensations based on the genre of

music.

Levinson (1982) supported Walton's theory and he claimed that when an

individual with intense affective response towards music, it is basically consider in

identification and apperception of particular emotional expression. Levinson (1982) also

stated that specific "intense affective response" to sad music will involve in imaginary

arousal and reduced the misery feelings cognitively.

2.3.2 Affective Infusion Model (AIM)

AIM explains emotional information is integrated into individuals' perception and

cognitive processing, which sequentially affecting their associative processes, awareness,

judgment, recollection and the subsequent behaviours from conjecture (Forgas, 1995).

AIM can be explained further by two main domains which are affect-as-information

approach and affect-priming principle.

Affect-as-information approach supports that feeling and emotions of individuals

directly influence the way of making decisions or perceptions by heuristic processing, in

particular they are inclined to formulate mood-congruent evaluation (Schwarz & Clore,

1983). For instance, people with positive emotions will signify the situation as

nonthreatening and usual, which encourages them to adopt heuristic processing strategy

without paying any attention to detail and depending on unspecific existing knowledge

(Schwarz & Bless, 1991; Bless, et al., 1996). They are not inspired to exert any cognitive

effort which cause people more willing to seek for risky financial behaviour (Clore &

Schwarz, 1988; Schwarz, 1990).

In affect-priming principle, emotions can affect judgment indirectly through

substantive processing by selectively manipulating in encoding, consideration and recall

of memory (Singer & Salovey, 1988). For instance, positive emotions aid in encoding

and retrieval of positive memory and therefore provide the form of judgment

corresponding to positive memories (Albarracín & Kumkale, 2003; Forgas & Bower,

1987). People with negative emotions will judge that particular situation as taxing and

specific which gives rise to problem and unfavorable consequences. This can motivate

people to process negative information in detailed and systematically and rely mostly on

incoming information from external environment, which induce lower tendency to take

risk (Mayer, Gaschke, Braverman, & Evans, 1992).

2.3.3 Mood Maintenance Hypothesis (MMH)

AIM and MMH suggested two completely opposite explanations about the indication

of particular impact. MMH proposed that people with positive mood are more liable to

perform more carefully in risky conditions, specifically while possible losses are tangible

to maintain and safeguard their existing positive emotional conditions (Isen & Patrick,

1983; Isen & Geva, 1987). This hypothesis suggested that individuals with happy

emotional state have higher tendency to avoid risk to maintain positive state, whereas

individuals with sad emotional state more likely to involve in risk-taking behaviour as

they desire that more positive consequences can boost or enhance their emotions (Isen &

Patrick, 1983). For instance, when in situation of probable financial gain is low and

possibility to loss is high, people with induced positive emotions less willing to bet (Isen

& Patrick, 1983).

2.4 Conceptual framework

   Based on Aesthetic Theory and past studies (Kenealy, 1997; Martin & Metha,

1997; Thompson et al., 2001), music with fast tempo which can be considered as happy

music, which will induce happy emotions, whereas music with slow tempo will induce

sad emotions. Moreover, past study presented by Schwarz and Clore (1983) supports the

concept of AIM by showing that happy emotion will foster higher risk-taking behaviour,

but sad emotions will promote lower risk-taking behaviour. Fast tempo of music will

induce gambling behaviour (Dixon, Trigg & Griffiths, 2007).

```
┌─────────────────────┐
│ Music               │
│ -Happy              │
│ -Sad                │
│ -Control (no music) │
└─────────────────────┘
```

```
┌─────────────────────┐     Time taken to      ┌──────────────────┐
│ Emotions            │     make decision       │ Risky            │
│ -Happy              │ ──────────────────────► │ Investment       │
│ -Sad                │                         │ related          │
│ -Neutral            │                         │ behaviour        │
└─────────────────────┘                         └──────────────────┘
```
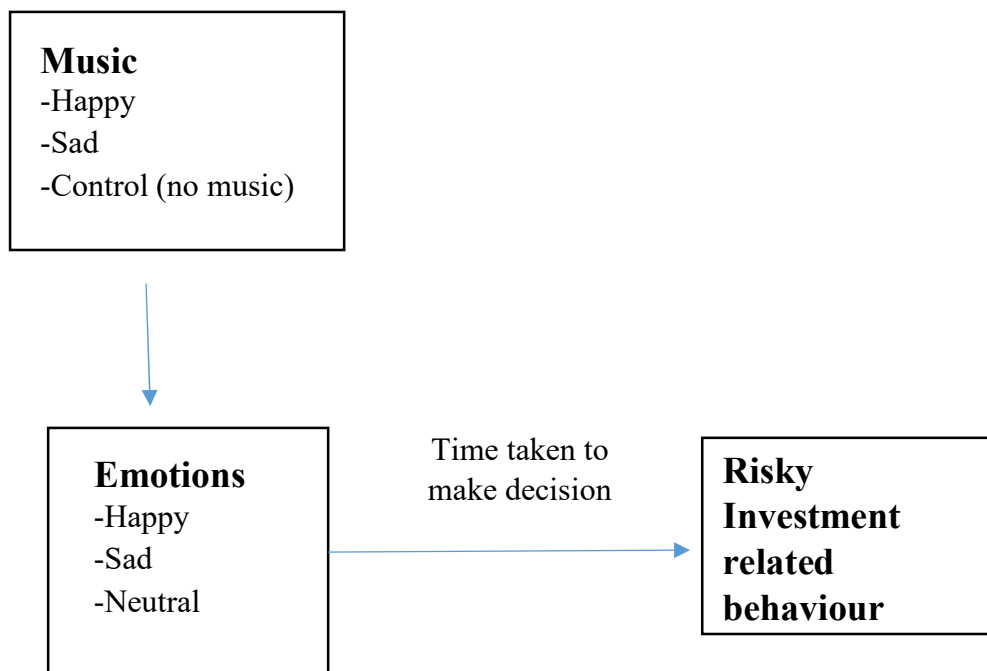
Figure 1. The conceptual framework of the proposed experimental study

Chapter 3: Methodology

3.1 Research Design

Quasi-experimental design was adopted in this study. The independent variables in this study were the conditions of the music and the dependent variables were the induced emotions, risky decisions and time taken to make investment-related decision. The participants were being randomly separated into control group and two experimental groups (sad or happy music), and the participants only participated in one condition of each group. The control group had no musical stimuli while the emotions of participants in experimental condition were induced with either happy or sad music. Participants in both control and experimental conditions had their emotions, risk-taking behaviour and time for making decisions recorded.

3.2 Research Samples

The participants consisted of undergraduate university students in UTAR, Kampar campus. Participants were recruited across four faculties, Faculty of Arts and Social Sciences (FAS), Faculty of Information and Communication Technology (FICT), Faculty of Business and Finance (FBF) and Faculty of Science (FSC). As Cohen, Manion, and Morrison (2007) stated, a minimum of 30 participants needed for experimental study. A total of 125 participants participated in the present study based on the results of calculation by using G power (refer to Appendix) (Faul, Erdfelder, Buchner, & Lang, 2009). A total of 5 samples were excluded after the screening of emotions before experiment because they were experiencing extreme emotions (very sad or very happy) prior to the experiment. This screening process is needed to ensure accuracy of results involving induced emotions. Thus, the final sample consisted of 120 participants. The

sample consisted of male (n=58; 48.33%) and female (n=62; 51.67%). Their age ranged

from18 to 25 (M = 21.28, SD = 1.71). The participants consisted with majority of 118

Chinese (98.33%), 1 Malaysian-Siam (0.008%) and 1 Indian (0.008%). For three

different conditions of music (happy, sad and neutral), 40 participants were assigned to

each condition.

3.3 Sampling Technique

Convenience sampling method was used as it was effortless and more convenient to

conduct a quasi-experiment by recruiting participants who were easily approached or

accessed. The participants were then randomly assigned into experimental or control

groups.

3.4 Research Location

Due to the present experimental study required participants for listening to music

that have prepared through headphones, it was conducted in a silent and comfortable

surrounding to avoid other extraneous or confounding variables for instance noise that

would affect the results of study. To ensure that all experimental conditions are

standardized across all participants, the experiment was conducted in Universiti Tunku

Abdul Rahman (UTAR) computer lab.

3.5 Instrumentation

Music. A computer was used to play the music. An eyeshade was used to cover the

eyes of the participants while listening to the musical pieces. Happy music piece, "The

Arrival of the Queen of Sheba" by George Federic Handel was used in this study. Sad

music piece, "Adagio for Strings" by Samuel Barber was used. "The Arrival of the Queen

of Sheba" had been used in a similar study to induce happy emotion (Koelsch et al.,

2013). "Adagio for Strings" was used by Pehrs et al. (2013) in a similar study to induce

negative emotion.

   Emotion. A total of 5 items from Geneva Emotions Music Scale (GEMS) was used

in the present study to identify the happy or sad-induced emotions from the particular

music. GEMS contains nine domains, which are wonder, transcendence, tenderness,

nostalgia, peacefulness, power, joyful activation, tension and sadness and three

dimensions which are sublimity, vitality and unease (Zentner, Grandjean, & Scherer,

2008). Three questions from joyful activation and two questions from sadness were used.

Each item is a score on 5-point scale (ranging from 1 = not at all to 5 = very much) and

these scores were added (Zentner, Grandjean, & Scherer, 2008). Higher score on joyful

activation indicated that higher happy emotions induced, same goes to sadness scores.

The internal consistency for sublimity is .859, vitality is .914 and unease is .694 (Rau,

2014)***.***

   Risky Decision and Time Taken for Decision Making. Participants were required to

make a decision based on a scenario, which was listed in the paper sheet. Stopwatch was

also used to record the time taken for the participants to make their decision.

   IGT is a computerized card game designed to measure risky decision making

tendencies or individuals' sensitivity to reward and loss (Franken, van Strien, Nijs &

Muris, 2008). The concept of IGT was used in this study. Two choices of risky decision,

which contain less risky and more risky decision, were available on the paper sheet for

the participants to decide.

   A total of 12 items from Domain-Specific Risk-Taking (DOSPERT) was used in this

study to cross-check the result. DOSPERT contain two subscales, which are risk-taking

and risk perception, and these subscales comprises five domains, which are financial,

ethical, health/safety, recreational and social (Blais & Weber, 2006). Six questions from

the financial domain of both subscales each, were used in this study. Each item is score

on a seven point (ranging from 1 = extremely unlikely to 7 = extremely likely), and these

score were added. Higher scores indicated greater risk-taking in the financial domain for

both subscales. The internal consistency for risk-taking subscale range from .71 to. 86,

whereas for risk-perception subscale, it ranges from .74 to .83.

3.6 Procedure

Participants were randomly separated into control groups and experimental groups.

Each group of participants were placed in a comfortable room with minimal distraction.

A briefing session was conducted to allow the participants to understand the purpose of

all the procedures of the experiment. Informed consent was obtained to allow the

participants to know their rights in the experiment.

First, the participants were blindfolded and they were asked to listen to a musical

piece according to their own experiment condition. Instrumental musical pieces, "The

Arrival of the Queen of Sheba" was used in the happy condition, while "Adagio for

Strings" was used in sad condition. The music was played in a suitable volume. After

listening to the music, the participants were asked to record their feelings. Under the IGT

task, participants were given a scenario. The given scenario was that they need to imagine

that they are common undergraduates who borrow money for their university expenses.

They will need to pay off this debt when they start to work and they also need to afford

car and houses loan in the future. Based on IGT concept, choices on investment with

different rewards (high or low) are used to indicate the risk-taking behaviour of the

participants. The participants were given two type of risky investment choices, which are

low and high risk investment. The time taken for the participants to make risky decision

was recorded. Next, the DOSPERT questionnaires were given to allow the participants to

fill in.

A debriefing session was conducted to allow the participants to understand the true

purpose of the experiment. Contact information were given if the participants are

interested to know the results of the study.

3.7 Pilot Study

The first pilot study was done at the psychology lab with eight students. During

the procedure, mistakes were found in the description of investment choices in Section D

of the questionnaire. The description in both choices are too obvious and the investment

returns are both extreme, which leads the participants to choose to a less risky choice.

Furthermore, issues with the Likert scale was found in Section E of the questionnaire.

Although this did not pose a major issue, the scale was rectified for the second pilot and

actual study. Moreover, initially the instructions of Section B and Section D stated that

participants are required to shade their choice. Then it was changed to tick one of the

choices to avoid wasting of time.

A second pilot study was initiated with twelve undergraduate students from different

faculties, such as FICT, FAS, FSC and FBF. These twelves students are comprised of 9

males and 3 females, and 11 of them are Chinese, and 1 of them is Indian. In this pilot

study, the music volume was regulated to a suitable volume so participants do not feel

any discomfort from the music volume in the actual study. The protocol for time-taking

was also practiced so there will be less complication in the actual study. Briefing and

debriefing were conducted to enable the participants to know their right in the study and

understand the purpose of the study

3.8 Data Analysis

IBM SPSS 23 was used to compute and further analysis of the statistical results.

The independent t-test was conducted to test for the difference in induced-sad and

induced-happy emotions between happy and sad music. The mean for both conditions of

GEMS questionnaire were calculated. Subsequently, one-way ANOVA was used to test

for the difference in risk-taking behaviour (Section D and Section E (DOSPERT

questionnaire) and risk-perception (Section F) across three music-induced conditions (sad,

happy and neutral). The Tukey Post Hoc test was conducted in advance to further

examined the mean difference between three conditions. Lastly, the independent t-test

was also conducted to test for the difference in time taken to make risky decisions

(Section D) between happy and sad-induced music conditions. The mean of time taken

for both induced-music conditions was also computed.

Chapter 4 : Results

The present study examined the effect of music-induced emotions (happy and sad) on investment-related risk taking behavior (low-risk and high-risk) and the difference in time needed for happy and sad emotions to make risky decision. Happy and sad emotions served as the experimental group, whereas neutral condition (condition without any music) served as the controlled group. Data cleaning has been carried out before executing any statistical test to remove the incomplete or influential data from calculation. There was no missing data found. However, there were a total of 5 samples being excluded from the database as extreme emotions (extreme happy and extreme sad) of participants found from screening emotions test as it would affect the accuracy of data collected when emotions are induced under the music conditions. There was a total of 120 participants involved in final results. All data were checked twice in order to ensure that they have been coded and keyed in correctly.

4.1 Music Condition and Induced Emotions

H1: Happy music will induce positive emotion, whereas sad music will induce negative emotion in the participants.

Levene's test is used to test the homogeneity variance between happy and sad music conditions in both happy and sad music-induced emotions. Results of Levene's test shown non- significant (p>.05) in happy emotions, the variance were equal for both music, $F(1,78) = 0.21$. Independent t test was conducted to test the difference in happy and sad music between happy-induced emotions. Results of independence t-test showed that happy music (M = 10.68, SD = 2.08) and sad music (M = 5.88, SD = 2.00) differed significantly in effect of induced happy emotions, $t(78) = 10.51$, p= .00 as shown in Table

1. The mean for happy music is higher than sad music in effect of induced happy emotions. The results shown that participants in happy music- condition scored significantly higher means in the happy induced-emotions ratings compared to participants under sad music-induced condition. Therefore, happy music significantly induced happy emotions than sad music.

Results of Levene's test shown significant (p<.001) in sad emotions, the variance were both unequal in sad emotions for both music, $F(1,78) = 14.93$. Results for equal variances not assumed were taken. It indicated that there is a significant difference in variances between happy music (M = 2.60, SD = 1.34) and sad music (M = 6.73, SD = 2.06) on sad-induced emotions. Mean variances of sad music is higher than happy music. Besides, result of independent t-test showed that there is a significant difference in sad-induced emotions between happy (M = 2.60, SD = 1.34) and sad music (M = 6.73, SD = 2.06), $t(78) = -10.62$, p= .00 as shown in Table 1. The mean for sad music is higher than happy music in effect of induced sad emotions. The results showed participants in sad music condition scored higher mean for sad induced-emotions ratings compared to participants in happy music-induced condition. Sad music significantly induced sad emotions than happy music.

Therefore, the first hypothesis (H1) was unable to be rejected as happy music was found to significantly induce happy emotions of participants, and sad music also significantly induced sad emotions in participants. Both music conditions induced the corresponding emotions.

Table 1

Mean differences of happy and sad music in happy and sad emotions

Variables	Undergraduate students (n= 80)			t	df	p
	n	Mean Difference	SD Error Difference			
Music-induced emotions						
Happy emotions	40	4.80000	.45654	10.514	78	.000*
Sad emotions	40	-4.12500	.38860	-10.615	78	.000*

Note. *p<.05; n=80 as only these participants are in emotion-inducing conditions. The remaining 40 participants were in control conditions without background music.

4.2 Music and Risk-taking Behaviour

H2: Participants in the happy music stimulation will make riskier decisions compared to participants in the sad and neutral music conditions.

Levene's test is used to test the homogeneity variance between happy, sad music and neutral conditions in risky-decision making (Section D). Results of Levene's test and ANOVA test showed non- significant (p>.05) in risky-decision making between three music conditions, the variance were equal for three conditions, $F(2,117) = .00$, p = 2.00 (one-tailed) as shown in Table 2. Results for equal variances assumed were taken. It showed the same results in Levene's test with risky-taking behavior (Section E). There is non-significant (p>.05) in risk-taking behavior between happy (M = 20.40, SD = 0.71), sad (M = 21.10, SD = 4.11) and neutral (M = 21.03, SD = 5.53), the variance were equal for three conditions, $F(2,117) = 1.50$. Assumptions for valid ANOVA are fulfilled. The result of ANOVA shown there is no significant difference (p= 1.55), $F(2,117) = 0.26$

(one-tailed) as shown in Table 3. Post-Hoc and Tukey HSD test were conducted in

advance as shown in Table 4. The results shown non-significant different (p>.05) in

risk-taking behavior for three music conditions. Mean of risk-taking behavior for sad

music stimulation is the highest (M = 21.10, SD = 4.11), followed by neutral conditions

(M = 21.03, SD = 5.53) and happy music stimulation (M = 20.40, SD = 4,71). Therefore,

the second hypothesis (H2) hypothesis was rejected as there was no significant difference

in risk-taking behavior between three music conditions and participants in sad music

stimulation made riskier decisions than sad music and neutral conditions.

Table 2

Analysis of variance (between-subjects effect of music-induced emotions on risk-taking

behaviour (Section D))

Risk-taking behaviour

	Mean Squares (MS)	df	F	p
Between Groups	.000	2	.000	1.000
Within Groups	.148	117		
Total	.148	119		

Table 3

Analysis of variance (between-subjects effect of music-induced emotions on risk-taking

behaviour (Section E))

Risk-taking behaviour

	Mean Squares (MS)	df	F	p
Between Groups	5.908	2	.255	0.776
Within Groups	23.215	117		
Total	29.123	119		

Table 4

Dependent Variable: Risk-taking behaviour (Section E)

Tukey Post-Hoc for Three Music Conditions

Music		Mean Difference (I-J)	p
No music (Control)	Happy	.62500	.831
	Sad	-.07500	.997
Happy	No music	-.62500	.831
	Sad	-.70000	.793
Sad	No music	.07500	.997
	Happy	.70000	.793

Levene's test is used to test the homogeneity of variance between happy, sad music and neutral conditions in risk perceptions (Section E). Results of Levene's test shown non- significant (p>.05) in risk perception between happy and sad music, the variance were equal for three conditions, $F(2,117) = 0.84$. Results for equal variances assumed were taken. The result of ANOVA shown there is no significant difference (p= 0.55), $F(2,117) = 0.61$ as shown in Table 5. Post-Hoc and Tukey HSD test were conducted in advance. The results shown non-significant different (p>.05) in risk perceptions for three music conditions. Mean of perceptions for sad music stimulation is the highest (M = 26.95, SD = 4.56), followed by neutral conditions (M = 25.95, SD = 5.15) and happy music stimulation (M = 25.78, SD = 5.68) music conditions.

Table 5

Analysis of variance (between-subjects effect of music-induced emotions on risk

perceptions (Section F))

Risk perceptions

	Mean Squares (MS)	**df**	**F**	**p**
Between Groups	16.075	2	.605	.548
Within Groups	26.554	117		
Total	42.629	119		

Table 6

Dependent Variable: Risk perceptions (Section F)

Tukey Post-Hoc for Three Music Conditions

Music		**Mean Difference (I-J)**	**p**
No music (Control)	Happy	.17500	.987
	Sad	-1.00000	.662
Happy	No music	-.17500	.987
	Sad	-1.17500	.566
Sad	No music	1.00000	.662
	Happy	1.17500	.566

4.3 Induced-emotions and Time Taken to Make Risky Decisions

H3: There is no difference in time taken to make risky decisions between

participants with induced positive and induced negative emotions.

Levene's test is used to test the homogeneity of variance between induced happy

(happy) and sad (negative) emotion in time taken to make risky decisions. Results of

Levene's test shown significant ($p<.001$) in time taken, the variance were unequal for

both happy (M = 30.11, SD = 11.15) and sad (M = 47.88, SD = 27.80) induced emotions,

$F(1,78) = 9.49$. Results for equal variances not assumed were taken. Results of

independence t test shown that positive-induced emotions and negative-induced emotions

differ significantly in time taken to make risky decision, $t(78) = -2.49$, p= .015. The

mean for induced negative emotions in time taken to make risky decisions (M = 41.88,

SD = 27.80) is higher than induced positive emotions (M = 30.11, SD = 11.15).

Therefore, the third hypothesis (H3) is rejected as there is a significant difference

between induced happy (positive) and negative (sad) emotions in time taken to make

risky decisions.

Table 7

Mean differences of induced-positive and negative emotions in time taken to make risky

decisions (Section D)

Variables	Undergraduate students (n= 80)		t	df	p
	Mean Difference	SD Error Difference			
Time taken to make risky decisions	-11.77500	4.73625	-2.486	78	.015*

Note. *p<.05

Chapter 5: Discussion and Conclusion

5.1 Music and Emotion

The findings in this study indicated that participants who are placed under happy

music condition will experience positive induced emotion, whereas participants who are

placed under sad music condition will experience negative induced emotion.

This finding is consistent with the knowledge that different type of musics can

influence different emotions (Krumhansl, 1997). Furthermore, the two songs used in this

study, which are "Adagio for Strings" (Pehrs et al, 2013) and " The Arrival of Queen

Sheba" (Koelsch et al., 2013) had been used in past studies, and it showed that the former

induced sad emotion, whereas the latter induced positive emotion. The sad music used in

this study have the basic musical features that can induce sad emotion, such as minor key,

slow tempo, and low pitch variation (Juslin & Laukka, 2004; Lundqvist, Carlsson,

Hilmersson, & Juslin, 2009), whereas the happy music has the opposite musical features

to induce happy emotion. Thus, musical pieces with minor key, slow tempo and low pitch

variation can induce negative sad emotion, whereas musical piece with major key, fast

tempo and high pitch variation can induce positive emotion. Although the choice of

music was chosen from Western context studies, similar findings were found when

replicated in Asian context. Hence, it implies that this two musical pieces can be used to

induce emotions relatively across cultures.

5.2 Emotion and Risk Taking Behaviour

In this study, there was no significant difference in risk-taking behaviour between

participants under induced positive and negative emotions. However, majority of the

participants in this study chose the less risky choice from the two investment related

choices given. Nevertheless, the current findings are in contrast with findings from past

studies (Schunk & Betsch, 2006; Palazzi et al., 2018; Schulreich et al., 2014; Zhao, 2006)

and this may be attributed to some differences in regards to cultural context and

demographics of participants as well as the study protocol of this study and previous

studies might cause the difference of result. Moreover, some internal and external factors

can also cause the result to be different from the past results.

For instance, most of the past studies are conducted at the Western context (Schunk

& Betsch, 2006; Palazzi et al., 2018; Schulreich et al., 2014; Zhao, 2006), and culture

difference might affect the inconsistency of the result. Weber and Hsee (1998) stated that

people with different cultural background have different perception towards risk

preference. One of the past research proved that Chinese do not tend to take risk in

personal finance, compared with the Americans (Hsee & Weber, 1999). Fan and Xiao

(2006), performed an empirical study and they also found out that the Asian culture is

more conservative towards risk taking, compared with the Americans. Hence, people who

are more conservative will tend to choose the investment with the lower risk and will less

likely to take higher risk investment choice. Thus, the inconsistency of result can imply

that the participants in the study can be affected by the conservative culture and they will

choose the less risky choice no matter what emotions they feel at that current moment.

Another factor that can cause the inconsistency of the result is the participants in this

study do not get easily affected by their emotion in choosing investment choices. This

can be explained by the Rational Choice Theory (RCT) which stated that rational

judgment motivates human behaviour. One of the assumption of RCT is the actor chooses

an additional choice that he/she believes that it will bring a social outcome that

maximizes his/her benefits under subjectively conceived constraints (Sato, 2013). Hence,

people will try to process the choices that they have and they are more likely to choose

the choice that can bring more profit and reduce their chance of loss. The participants in

this study could be using rational judgement to choose the less risky choice as they think

it will bring more benefit as the other higher risky choice might cause them to lose more.

Moreover, most of the participants are having student loans while they are studying in

UTAR. At this age and due to cultural factors, university students will think that they

need to start working after they graduated and they will have traditional mind-set of

having a car and a house, and these have become a priority compared to earning a

possibility high income in investment (Chow, Kwan, Ng, Ng & Loh, 2017). Thus, they

will think of the choice that bring a better benefit for them as they cannot afford to be

risky as they need to afford a lot of commodities in the future.

Furthermore, the description of the two investment related choices used in the study

are quite direct. The choices used in past studies (Hampton, 2017; Zhao, 2006; Schunk &

Betsch, 2006; Verdejo-Garcia, Bechara, Recknor & Perez-Garcia, 2006) are given in a

more complicated and abstract manner. Thus, the participants in previous studies are not

really aware the level of riskiness in those choices. However, in this study, the investment

related choices given are more direct and this might cause the participants to be aware of

the risk in the choices given. Hence, this might cause them to choose a choice that is safer

and brings more benefit to them, instead of choosing the choice with a higher risk.

5.3 Induced Emotions and Time Taken to Make Risky Decision

The current study found significant difference in time taken to make risky investment

related decisions between participants under positive and negative induced emotions. The

participants with negative induced emotions spent more time in choosing investment related choices, compared with positive induced emotion. This finding is in contrast with other past studies in certain aspects.

A study by Zhao (2006) showed that there is no significant difference between induced emotions and time taken to make risky decisions. However, there was a past study that showed there is a significant difference because participants who were exposed to happy film used shorter time to make decision, compared to those participants who were exposed to sad film (Duque, Turla & Evangelista, 2013). In general, the experiment yielded a result that participant with happy mood, the process of deciding on what to do is faster than the negative mood with undecided and distorted thought which take more time to process information.

In this study, participants with induced sad emotion spent more time in making risky decision than participants with induced happy emotion. Past research that examine the relationship between mood and information processing stated that positive mood is associated with a simple way of searching information in making decision, which are faster, more selective, and less redundant (Mann, 1992). In contrary, negative emotion shows signs of slowing down decision making process, reluctance to make decisions, and have higher tendency to give greater weight to risks than to benefits (Brandstatter & Eliasz, 2001). Thus, positive mood can cause shorter information-processing activities, which cause faster in making decision (Brandstatter & Eliasz, 2001). This implies that the participants with induced happy emotion in this study may process information and make decision faster than participants with induced negative emotion. It is important to have

more future studies to examine the cognitive process and mechanism that how emotions

affect the time taken to make risky decision.

5.4 Limitation and Suggestions for Improvement

There are several limitations in this study. One of the limitation is the description of

investment choices that the participants chose in Section D. The descriptions of the

choices were quite direct, which might cause the participants to be aware of the risk

within choices given, thus leading them to choose a less risky and safer choice. Moreover,

there are participants who were not clear about the description of choice, such as they do

not know about how much money they are given and the amount of exact profit they will

gain after the investment. Furthermore, most of the recruited participants are Chinese, so

the results of this study may not be representative of university students from other races

A suggestion for future studies would involve amendments to the description of

investment choices, which should be given in abstract and scenario manner so the

participants will be unaware of the level of riskiness of the investment choices, thus

reducing the likelihood that they will choose the less risky investment choice. Moreover,

the IGT concept should be applied more in the study. The IGT concept involves four

decks of cards, and provision of information on specified initial amount to invest and

specified amount of money rewarded. Participants are given instruction to make as much

money as possible and avoid losing (Verdejo-Garcia et al., 2006). Hence, this concept

will provide a clearer view of the process of choosing an investment choice and the

participants will be unaware of the level of riskiness. Moreover, it is recommended to

recruit more participants from other ethnicities to make cross-cultural comparisons and to

be more representative of the university student population. Studying cultural difference

may be important to determine if cultural factors can affect risky decision making. Lastly,

mixed mode research method could be recommended for future study as interview

method can be used to understand their reason for making the investment choices.

5.5 Implications

This current study displays its implications are not merely for financial and

investment field but also applicable to clinical settings by investigating the impulsive

behaviours through rapid decision making. There were plentiful studies that have focused

on the effect of induced-emotions on risk taking tasks in Western countries, but not much

related studies been done in Asian countries. The concept of IGT which adopted in this

study can be employed by investment consultants or advisors as a pre-investment test in

Malaysia. The consultants can formulate capital investment program for investors

according to the results of risky investment choices task. This is because some of the

investors might be keen on long-term return but low risk investment plan and some

investors may prefer larger returns in short-term period. This can also be helpful in

financial planning for investors to be more aware of one's investment behaviour. Few

participants reported that they have more understanding on their risky investment

behaviour and knowledge regarding investment after having participated in this study.

Moreover, risky investment choices task can also be one of the screening tools to

identify the impulsive behaviour of individual at the initial stage of clinical study. Clark,

Robbins, Ersche, and Sahakian (2006) supported that impulsive behaviour can be

determined by the rapid level in decision making without further thinking about the

consequences. The results of this study shown that there was a large difference or gap

found in time taken for participants to make risky investment choices. Some participants

have occupied less than 10 seconds to make the risky choices.

5.6 Conclusion

This study demonstrated that background music that is manipulated using musical

features such as key, tempo and pitch has the ability to affect or induce a particular

emotion. However, this study failed to show that different induced emotion can cause any

difference in investment related risky decision making. Cultural factors might play a role

in affecting an individual's perception towards making risky decision. It is recommended

for future studies to include cultural factors to understand the risk perception of people

from Asian context. This study also shows that people with induced negative emotion

spent more time to make risky decision than people with induced positive emotion. It can

be inferred that negative emotion will interfere people's ability to process information,

thus using longer time to make risky decision. In contrary, positive emotion show

significantly less confusion in their decision making process, thus using lesser time to

make risky decisions.

References

Albarracín, D., & Kumkale, G. T. (2003). Affect as information in persuasion: A

model of affect identification and discounting. *Journal of Personality and*

Social Psychology, 84(3), 453-469. doi:10.1037/0022-3514.84.3.453

Aldwell, E., & Schachter, C. (2003). Harmony and Voice Leading, 3rEd. *Belmont, CA:*

Wadsworth.

Allen, R. E. (1992). *The Concise Oxford Dictionary* (p.781). United Kingdom:

Oxford University Press.

Asian Institute of Finance. (2015). *Finance matters: understanding gen y* . Retrieved

from https://www.aif.org.m y/clients/aif_d01/assets/multimediaMS/publication/

Finance_Matters_Understanding_Gen_Y_Bridging_the_Knowledge_Gap_of_Ma

laysias_Millennials.pdf.

Ashton, J., Gerrard, B., & Hudson, R. (2003). Economic impact of national sporting

success: Evidence from the London Stock Exchange. *Applied Economic Letters,*

10(1), 783-785.

Au, K., Chan, F., Wang, D., & Vertinsky, I. (2003). Mood in foreign exchange trading:

Cognitive processes and performance. *Organizational Behavior and Human*

Decision Processes, *91*(2), 322-338. doi: 10.1016/S0749-5978(02)00510-1

Bakar, S., & Ng, A. C. Y. (2016). The impact of psychological factors on investors'

decision making in Malaysian stock market: A case of Klang Valley and Pahang.

Procedia Economics and Finance, 35(1), 319-328.

Bartlett, D. L. (1996). *Physiological responses to music and sound stimuli.* (2nd ed.).

Lawrence, KS: Handbook of music psychology.

Bashir, T., Azam, N., Butt, A. A., Javed, A., & Tanvir, A. (2013). Are behavioural

biases influenced by demographic characteristics & personality traits? Evidence from

Pakistan. *European Scientific Journal, 9*(29), 277-293.

Behen, M. E., Jeong, J. W., Diwadkar, V. A., Chugani, C. D., Sinsoongsud, P., Muzik,

O.,… Chugani, D. C. (2011). Congruence of happy and sad emotion in music and

faces modifies cortical audiovisual activation. *NeuroImage, 54*(4), 2973-2982.

Bernoulli, D. (1954). Exposition of a new theory on the measurement of risk.

Econometrica, 22(1), 23-36.

Blais, A. R., & Weber, E. U. (2006). A Domain-Specific Risk-Taking (DOSPERT)

scale for adult populations. *Judgement and Decision Making, 1*(1), 33-47.

doi:10.1037/t13084-000

Bless, H., Clore, G. L., Schwarz, N., Golisano, V., Rabe, C., & Wolk, M. (1996).

Mood and the use of scripts: Does a happy mood really lead to mindlessness?

Journal of Personality and Social Psychology, 71(4), 665-679.

Brandstatter, H., & Eliasz, A. (2001). *Persons, situations, and emotions: An ecological

approach*. Madison Avenue, NY: Oxford University Press

Burkholder, J. P., Grout, D., & Palisca, C. (2005). *A history of western music* (7th ed.).

New York, NY: Norton.

Charles, A., & Kasilingam, R. (2015). Do investor's emotions determine their

investment decisions? *A Management Journal, 6*(2), 1-28.

Chou, K. L., & Lee, T. M. (2007). Does mood state change risk-taking tendency in

older adults? *Psychology and Aging, 22*(2), 310-318.

doi:10.1037/0882-7974.22.2.310

Chow, S. W., Kwan, W. S., Ng, S. J., Ng, Z. Y., & Loh, W. S. H. (2017). *Malaysian*

youth's perspective on investing in stock market. A research project submitted to

Universiti Tunku Abdul Rahman. Universiti Tunku Abdul Rahman, Perak,

Malaysia.

Clark, L., Robbins, T. W., Ersche, K. D., & Sahakian, B. J. (2006). Reflection

impulsivity in current and former substance users. *Biological Psychiatry, 60*(5),

515-522. doi:10.1016/j.biopsych.2005.11.007

Clore, G., & Schwarz, N. (1988). How do I feel about it? The informative function of

affective states. In K. Fiedler & J. Forgas (Eds.) *Affect, cognition, and social*

behaviour (pp.44- 62). Toronto: Hogrefe.

Coan, J. A., & Allen, J. J. B. (2007). *The handbook of emotion elicitation and*

assessment. New York, NY: Oxford University Press.

Cohen, L., Manion, L., & Morrison, K. (2007). Research methods in education (6th

ed.).New York, NY: Routledge.

Colasante, A., Marini, M., & Russo, A. (2017, February 21). Incidental emotions and

    risk-taking: An experimental analysis. *Munich Personal RePEc Archive, 1*(1),

    1-32. Retrieved from https://mpra.ub.uni-muenchen.de/82767/

Collier, W. G., & Hubbard, T. L. (2001). Musical scales and evaluations of happiness and

    awkwardness: Effects of pitch, direction, and scale mode. *The American Journal of*

    Psychology, 114(3), 355-375. doi: 10.2307/1423686

Cooke, D. (1959). *The language of music.* Oxford, UK: Oxford University Press.

Crowder, R. G. (1984). Perception of the major/ minor distinction: Hedonic, musical,

    and affective discriminations. *Bulletin of The Psychonomic Society, 23*(1),

    314-316.

Dixon, L., Trigg, R., & Griffiths, M. (2007). An empirical investigation of music and

    gambling. *International Gambling Studies, 7*(3), 315-326.

    doi:10.1080/14459790701601471

Drichoutis, A., & Nayga, R. (2013). Eliciting risk and time preferences under induced

    mood states. *The Journal of Socio-economics, 45*(1), 18-27.

    doi:10.1016/j.socec.2013.04.008

Du, X., Li, J., & Du, X. (2014). Testing risk-taking behavior in Chinese

    undergraduate students. *PloS one*, *9*(5), e97989. doi:

    10.1371/journal.pone.0097989

Duque, M. J., Turla, C., & Evangelista, L. (2013). Effects of emotional state on decision

    making time. Procedia- Social and Behavioral Sciences, 97(1), 137-146. doi:

    10.1016/j.sbspro.2013.10.214

Dreman, D., Johnson, S., MacGregor, D., & Slovic, P. (2001). A report on the March

2001 investor sentiment survey. *The Journal of Psychology and Financial

Markets*, *2*(3), 126-134.

Eisenberg, N., & Spinrad, T. L. (2004). Emotion-related regulation: Sharpening the

definition. *Child Development, 75*(2), 334-339. doi:

10.1111/j.1467-8624.2004.00674.x

Engelmann, J. B., & Tamir, D. (2009). Individual differences in risk preference

predict neural responses during financial decision-making. *Brain Research,

1290*(1), 28-51. doi:10.1016/j.brainres.2009.06.078

Fan, J. X., & Xiao, J. J. (2006). Cross-cultural differences in risk tolerance: a

comparison between Chinese and Americans. *Journal of Personal Finance, 5*(1),

54-75.

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses

using G*Power 3.1: Tests for correlation and regression analyses. *Behaviour

Research Methods, 41*(1), 1149-1160.

Fredrickson, B. L. (1998). What good are positive emotions? *Review of General

Psychology, 2*(1), 300-319.

Forgas, J. P. (1995). Mood and judgment: The Affect Infusion Model (AIM).

Psychological Bulletin, 117(1), 39-66.

Forgas, J. P., & Bower, G. H. (1987). Mood effects on person-perception judgments.

Journal of Personality and Social Psychology, 53(1), 53-60.

doi:10.1037/0022-3514.53.1.53

Franken, I. H. A., van Strien, J. W., Nijs, I. & Muris, P. (2008). Impulsivity is

associated with behavioural decision-making deficits. *Psychiatry Research, 158*(1),

155-163.

Gabbi, G., & Zanotti, G. (2010). *How emotional factors affect financial choices*. Paper

presented at the European Financial Management Association 2010 Annual Meetings,

Aarhus, Denmark.

Gabrielsson, A., & Lindström, E. (2001). The influence of musical structure on emotional

expression. In P. N. Juslin & J. A. Sloboda (eds), *Music and emotion: Theory and

research* (pp. 223-248). Oxford: Oxford University Press.

Grable, J. E., & Roszkowski, M. J. (2008). The influence of mood on the willingness to

take financial risks. *Journal of Risk Research*, *11*(7), 905-923. doi:

10.1080/13669870802090390

Gregory, A. H., & Varney, N. (1996). Cross cultural comparisons in the affective

response to music. *Psychology of Music, 24*(1), 47-52.

Halko, M. L., Mäkelä, T., Nummenmaa, L., Hlushchuk, Y., & Schürmann, M. (2015).

Hedonic context modulates risky choices and reward responses in amygdala

and dorsal striatum. *Journal of Neuroscience, Psychology, and Economics, 8*(2),

100–115. Retrieved from http://dx.doi.org/10.1037/ npe0000036

Hampton, J. E. (2017). *Risk behaviour, decision making, and music genre in

adolescent males*. A thesis submitted to graduate college of Marshall University.

Marshall University, West Virginia, USA.

Henver, K. (1935). The affective character of the major and minor modes in music.

American Journal of Community Psychology, 47(1), 103-118.

Herman, A. M., Critchley, H., & Duka, T. (2018). Risk-taking and impulsivity: The

role of mood states and interoception. *Frontiers in Psychology, 9*(1), 1625. doi:

10.3389/fpsyg.2018.01625

Hietnen, T. (2017). *University students' attitudes toward investing: A comparison*

between the United Kingdom and Finland. Thesis presented at University of

Wolverhampton. Wolverhampton, United Kingdom.

Hockey, G. R., Maule, A. J., Clough, P. J., & Bdzola, L. (2000). Effects of negative

mood states on risk in everyday decision making. *Cognition and Emotion, 14*(6),

823-855. Retrieved from https://doi.org/10.1080/02699930050156654

Hsee, C. K., & Weber, E. U. (1999). Cross-national differences in risk preference and

lay predictions. *Journal of Behavioral Decision Making, 12*(1), 165-179.

Hsee, C. K., & Rottenstreich, Y. (2003). *Music, pandas, and muggers: On the*

affective psychology of value. Chicago, IL: University of Chicago Press.

Husain, G., Thompson, W. F., & Schellenberg, E. (2002). Effects of musical tempo

and mode on arousal, mood, and spatil abilities. *Music Perception: An*

Interdisciplinary Journal, 20(1), 151-171.

Irwin, C. E. Jr. (1990). The theoretical concept of at-risk adolescents. *Adolescent*

Medicine, 1(1), 1-14.

Isen, A. M., & Geva, N. (1987). The influence of positive affect on acceptable level of

    risk: The person with a large canoe has a large worry. *Organizational Behaviour*

    and Human Decision Processes, 39(2), 145-154.

    doi:10.1016/0749-5978(87)90034-3

Isen, A. M., & Patrick, R. (1983). The effect of positive feelings on risk-taking: When

    the chips are down. *Organizational Behaviour & Human Performance, 31*(2),

    194-202. doi:10.1016/0030-5073(83)90120-4

Juslin, P. N., & Laukka, P. (2004). Expression, perception, and induction of musical

    emotions: a review and a questionnaire study of everyday listening. *Journal of*

    New Music Research 33(3), 217-238. doi: 10.1080/0929821042000317813

Kamaruddin, A. R., & Mokhlis, S. (2003). Consumer socialization, social structural

    factors and decision-making styles: A case study of adolescents in Malaysia,

    International Journal of Consumer Studies, 27(1), 145-156.

    doi:10.1046/j.1470-6431.2003.00297.x

Kastner, M. P., & Crowder, R. G. (1990). Perception of the major/minor distinction:

    IV. Emotional connotations in young children. *Music perception: An*

    interdisciplinary journal, *8*(2), 189-201. doi: 10.2307/40285496

Koelsch, S., Skouras, S., Fritz, T., Herrera, P., Bonhage, C., Küssner, M. B., & Jacobs, A.

    M. (2013). The roles of superficial amygdala and auditory cortex in   music-evoked

    fear and joy. *Neuroimage, 81*(1), 49-60. doi:10.1016/j.neuroimage.2013.05.008

Kaplanski, G., Levy, H., & Scopus, M. (2009). *Mispricing of Options: Perceived and*

    Actual Market Risk Sentiment Effect. Working Paper.

Kenealy, P. M. (1997). Mood-state-dependent retrieval: The effects of induced mood on

memory reconsidered. *Quarterly Journal of Experimental Psychology: Human*

Experimental Psychology, 50(1), 290-317.

Krumhansl, C. L. (1990). Cognitive foundations for musical pitch. New York, NY:

Oxford University Press.

Krumhansl, C. L. (1997). An exploratory study of musical emotions and

psychophysiology. *Canadian Journal of Experimental Psychology, 51*(1),

336-353.

Lerner, J. S., & Keltner, D. (2001). Fear, anger, and risk. *Journal of Personality and*

Psychology, 81(1), 146-159. doi:10.1037//0022-3514.81.1.146

Levinson, J. (1982). Music and negative emotions. *Pacific Philosophical Quarterly,*

63(1), 336.

Lundqvist, L.-O., Carlsson, F., & Hilmersson, P. (2009). Emotional responses to

music: Experience, expression, and physiology. *Psychology of Music, 37*(1),   61-90.

doi:10.1177/0305735607086048

Mann, L. (1992). Stress, affect and risk taking. In J. F. Yates (Ed.), *Risk taking*

behavior (pp. 202-230). New York: Wile

Martin, M. A., & Metha, A. (1997). Recall of early childhood memories through musical

mood induction. *Arts in Psychotherapy, 24*(1), 447- 454.

Mayer, J. D., Gaschke, Y. N., Braverman, D. L., & Evans, T. W. (1992).

Mood-congruent judgment is a general effect. *Journal of Personality and Social*

Psychology, 63(1), 119-132. doi:10.1037/0022-3514.63.1.119

Moeller, F. G., Barratt, E. S., Dougherty, D. M., Schmitz, J. M., & Swann, A. C.

(2001). Psychiatric aspects of impulsivity. *American Journal of Psychiatry, 158*(1),

1783-1793. doi:10.1176/appi.ajp.158.11.1783

Mordka, C. (2016). What are emotions? Structure and function of emotions. *Studia*

Humana, 5(3), 29-44. doi:10.1515/sh-2016-0013

Nurul, W. A., Murni Y. M., & Ripain, N. (2018). Scale and determinants of financial

literacy in Kolej Universiti Islam Antarabangsa Selangor students. *Reports on*

Economics and Finance, 4(3), 125-137. doi:10.12988/ref.2018.811

Palazzi, A., Fritzen, B. W., & Gauer, G. (2018). Music-induced emotion effects.

Psychology of Music, 1-23. doi:10.1177/0305735618779224

Parncutt, R. (2014). The emotional connotations of major versus minor tonality: One

or more origins?. *Musicae Scientiae*, *18*(3), 324-353. doi:

10.1177/1029864914542842

Pehrs, C., Deserno, L., Bakels, J. H., Schlochtermeier, S., Kappelhoff, H., Jacobs, A.

M., (2013). How music alters a kiss: Superior temporal gyrus controls

fusiform-amygdalar effective connectivity. *Social Cognition Affective*

Neuroscience, 1(1). doi:10.1093/scan/nst169

Peng, J., Miao, D., & Xiao, W. (2013). Why are gainers more risk seeking. *Judgement*

and Decision Making, 8(2), 150-160.

Peretz, I., Gagnon, L., & Bouchard, B. (1998). Music and emotion: Perceptual

   determinants, immediacy, and isolation after brain damage. *Cognition, 68*(1),

   111-141.

Peretz, I., & Vieillard, S. (2008). Liking for happy- and sad-sounding music: Effects of

   exposure. *Cognition and Emotion, 2*(22), 218-237.

Pinker, S. (1994). *The language instinct.* Bristol, United Kingdom: DA Information

   Services.

Pilhofer, M., & Day, H. (2012). *Music theory for dummies* (2nd ed.). Hoboken, NJ:

   John Wiley & Sons, Inc.

Raghunathanaf, R., & Pham, M. T. (1999). All negative moods are not equal:

   Motivational influences of anxiety and sadness on decision making. *Organizational

   Behaviour and Human Decision Processes, 79*(1), 56-77.

   doi:10.1006/obhd.1999.2838

Rau, P. P. (2014). *Cross-Cultural Design: 6th International Conference, CCD 2014.*

   Heraklion, Crete: Springer.

Reniers, R. L. E. P., Murphy, L., Lin, A., Bartolomé, S. P., & Wood, S. J. (2016).

   Risk perception and risk-taking behaviour during adolescence: The influence of

   personality and gender. *PLoSONE, 11*(4), e0153842. doi: 10.1371/journal.pone.

   0153842

Roederer, J. G. (2012). *Introduction to the Physics and Psychophysics of Music* (2

   ed.). New York, NY: Springer Science & Business Media.

Sato, Y. (2013). Rational choice theory. *Sociopedia.isa, 1*(1), 1-10. doi:

10.1177/205684601372

Schonberg, T., Fox, C. R., & Poldrack, R. A. (2011). Mind the gap: Bridging

economic and naturalistic risk-taking with cognitive neuroscience. *Trends in

Cognitive Sciences, 15*(1), 11-19. doi:10.1016/j.tics.2010.10.002]

Schulreich, S., Heussen, Y. G., Gerhardt, H., Mohr, P. N., Binkofski, F. C., Koelsch,

S., & Heekeren, H. R. (2004). Music-evoked incidental happiness modulates

probability weighting during risky lottery choices. *Frontiers in Psychology, 4*(1),

981. doi:10.3389/fpsyg.2013.00981

Schunk, D., & Betsch, C. (2006). Explaining heterogeneity in utility functions by

individual differences in decision modes. *Journal of Economic Psychology, 27*(1),

386-401. doi:10.1016/j.joep.2005.08.003

Schwarz, N. (1990). Feelings as information: Informational and motivational

functions of affective states. In E. T. Higgins & R. Sorrentino (Eds.), *Handbook   of

motivation and cognition: Foundations of social behavior* (pp. 527-561). New

York, NY: Guilford Press.

Schwarz, N., & Bless, H. (1991). Happy and mindless, but sad and smart? The impact

of affective states on analytic reasoning. In J. P. Forgas (Ed.), *Emotion and social

judgments* (pp.55- 72). New York, NY: Pergamon Press.

Schwarz, N., & Clore, G. L. (1983). Mood, misattribution, and judgments of

    well-being : informative and directive functions of affective states . *Journal of*

    Personality and Soical Psychology, 45(3), 513-523.

Schwarz, N., & Clore, G. L. (1996). Feelings and phenomenal experiences. In A.

    Kruglanski & E. T. Higgins (Eds.), *Social psychology. Handbook of basic*

    principles (pp.385- 407). New York, NY: Guiford.

Shelemay, K. K. (2006). Music, memory and history. *Ethnomusicology Forum, 15*(1),

    17-37. doi:10.1080/17411910600634221

Singer, J. A., & Salovey, P. (1988). Mood and memory: Evaluating the network

    theory of affect. *Clinical Psychology Review, 8*(2), 211-251.

    doi:10.1016/0272-7358(88)90060-8}

Slovic, P., Finucane, M. L., Peters, E., & MacGregor, D. G. (2004). Risk as analysis

    and risk as feelings: Some thought about affect, reason, risk, and rationality. *Risk*

    Analysis, 24(2), 311-322.

Sobkow, A., Traczyk, J., & Zaleskiewicz, T. (2016). The affective bases of risk

    perception: negative feelings and stress mediate the relationship between mental

    imagery and risk perception. *Frontiers in psychology*, 7, 932.

Team of American Century Investment (6 July 2012). *Diversify to take the edge off*

    swings in investor sentiment. Retrieved from

    https://www.advisorperspectives.com/commentaries/2012/06/07/diversify-to-take

    -the-edge-off-swings-in-investor-sentiment?channel=Education%20529

Thompson, W. F., & Quinto, L. (2011). Music and emotion: Psychological

considerations. In E. Schellekens, & P. Goldie (Eds.), *The aesthetic mind:*

Philosophy and psychology (pp.357-375). New York, NY: Oxford University Press.

Verdejo-Garcia, A., Bechara, A., Recknor, E. C., & Perez-Garcia, M. (2006).

Decision-making and the Iowa gambling task: Ecological validity in individuals

with substance dependence. *Psychologica Belgica, 46*(1-2), 55-78.

von Neumann, J., & Morgenstern, O. (1947). *Theory of games and economic*

behaviour. Princeton, NJ: Princeton University Press.

Walton, K. L. (1988). What is abstract about the art of music? *The Journal of*

Aesthetics and Art Criticism, 46(3), 351-364. doi:10.2307/431106

Wang, H. Q., Liu, Y., & Bi, Y. F. (2010). The effects of emotions and task frames on

risk preferences in self decision making and anticipating others' decisions. *Acta*

Psychologica Sinica, 42(3), 317-324.

Weber, E. U., & Hsee, C. (1998). Cross-cultural differences in risk perception, but cross-

cultural similarities in attitudes towards percieved risk. *Management Science, 44*(9),

1205-1217. doi: 10.1287/mnsc.44.9.1205

Yuan, K., Zheng, L., & Zhu, Q. (2006). Are investors moonstruck? Lunar phases and

stock returns. *Journal of Empirical Finance*, *13*(1), 1-23. doi:

10.1016/j.jempfin.2005.06.001

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

Zentner, M., Grandjean, D., & Scherer, K. R. (2008). Emotions evoked by the sound of

music: Characterization, classification, and measurement. *Emotion*, *8*(4), 494.

doi: 10.1037/1528-3542.8.4.494

Zhao, J. Y. (2006, May). *The effects of induced positive and negative emotions on risky

decision making.* Thesis presented at the 28th Annual Psychological Society of

Ireland Student Congress, Maynooth, Ireland.

Appendix A Materials Used

The listed materials in this section is used during conducting the research, which include

demographics, questionnaire and others.

UNIVERSITI TUNKU ABDUL RAHMAN (UTAR)
FACULTY ARTS AND SOCIAL SCIENCE (FAS)
THE EFFECT OF INDUCED EMOTIONS ON INVESTMENT- RELATED RISK
TAKING BEHAVIOUR AMONG UTAR UNDERGRADUATES

Introduction
The purpose of this research is to investigate the effect of music-induced emotions on risky investment behaviour among undergraduate students in Malaysia.

Procedures
This study contains five sections and you are required to read carefully and answer. You will need to fill in the demographic information in the data section provided. Next, you are required to state your emotion before the study begins. Next, you are required to be blindfolded and to listen to a piece of music provided. Your emotion will be recorded. Subsequently, you will be given a scenario and you will have to make decisions related to investment. The time taken for you to make the decision will be recorded. Lastly, you are required to fill in another questionnaire. The entire study will take approximately 15-20 minutes to be completed.

Confidentiality of information and voluntary participation
All of the personal information you have provided will be remained as anonymous and confidential. The information will not be disclosed to any unauthorized party, apart from the researchers. Participation for the current study is voluntarily. You have the right to withdraw from the research at any time with no penalty. Your responses will be recorded only for research analysis purpose. The findings will be documented in a final year thesis but all efforts will be made to de-identify participants. Your participation is much appreciated.

If have any further inquiries or information regarding results of research, please email to Goh Shaw Heng (Shawheng@1utar.my), Goh Kah Hong (aaa333@1utar.my).

Please tick the box provided below to indicate the agreement of participation.

Yes, I agree to participate in this study.	☐
No, I disagree to participate in this study.	☐

Section A: Demographic information of participant

1. Gender

☐ Male ☐ Female

2. Race

☐ Malay ☐ Chinese ☐ Indian
☐ Others: _____

3. Age :

4. Faculty of study:
[Example: Faculty Arts and Social Science (FAS)]

5. Course of study:
(Example: Bachelor of Arts and Social Science (HONS) Psychology)

6. Year of study : Year _____ Semester _____

7. Current week of study : _____ (Week 1)

8. Do you have any financial loan in your current life?
(Example: student loan/ car loan/ house loan)

☐ Yes ☐ No

Section B: Screening of Emotions
Rate and shade your current emotion
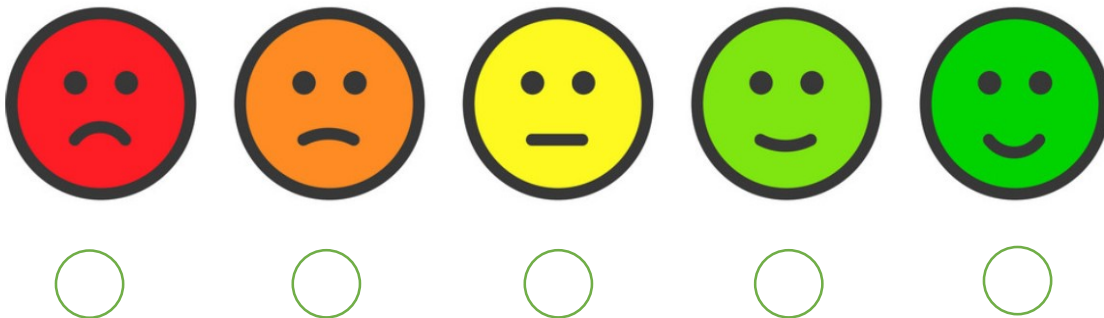
Section C: Inducing Emotions

Geneva Emotional Music Scale (GEMS-25)

Instructions
When providing your ratings, please describe how the music you listen to makes you *feel* (e.g., this music makes me *feel* sad). Do not describe the music (e.g., this music is sad) or what the music may be expressive of (e.g. this music expresses sadness). Bear in mind that a piece of music can be sad or can sound sad without making you feel sad. Please rate the intensity with which you felt each of the following feelings on a scale ranging from 1 (*not at all*) to 5 (*very much*).

1	2	3	4	5
Not at all	Somewhat	Moderately	Quite a lot	Very Much

1. _____ Animated   4. _____ Joyful

2. _____ Sad   5. _____ Tearful

3. _____ Bouncy

Section D : Investment-related risk-taking behaviour
Imagine that you are the person in the given scenario:

> Imagine yourself as an undergraduate student who had borrowed PTPTN loan for your study fees. You have to pay back the loan after you graduate. In the future, you will need to afford a car to get to places such as your work place. You will also need to buy a house to start a new family. In order to buy a house and a car, you will need to loan money from the bank. Furthermore, you will need to buy insurance for your safety. Subsequently, you participated in an investment game as you require a large amount of money to pay back your loan and other payments.

**DO NOT FLIP TO THE NEXT PAGE UNTIL THE
INSTRUCTOR GIVES FURTHER INSTRUCTIONS!!!
THANK YOU**

You are given two options (A and B) of investment. Please choose and shade **ONE** of the options given in these two investments which you think is more suitable. There are no right or wrong answer, so please answer honestly and provide a response which seems best to you.

A

There will be large return in shorter period, however the subjected to loss over profit is 60/40.

B

There will be small return consistently in long term period and the subjected to loss over profit is 50/50.

Section E: Domain-Specific Risk-Taking (Adult) Scale

Rate the scales below.

Domain-Specific Risk-Taking (Adult) Scale – Risk Taking

For each of the following statements, please indicate the **likelihood that you would engage in the described activity or behavior** if you were to find yourself in that situation. Provide a rating from *Extremely Unlikely* to *Extremely Likely*, using the following scale:

1- Extremely unlikely
2- Moderately unlikely
3- Somewhat unlikely
4- Not sure
5- Somewhat likely
6- Moderately likely
7- Extremely likely

Statements	Extremely unlikely						Extremely likely
1. Betting a day's income at the horse races. (F)	1	2	3	4	5	6	7
2. Investing 10% of your annual income in a moderate growth mutual fund. (F)	1	2	3	4	5	6	7
3. Betting a day's income at a high-stake poker game. (F)	1	2	3	4	5	6	7
4. Investing 5% of your annual income in a very speculative stock. (F)	1	2	3	4	5	6	7
5. Betting a day's income on the outcome of a sporting event. (F)	1	2	3	4	5	6	7
6. Investing 10% of your annual income in a new business venture. (F)	1	2	3	4	5	6	7

Note. F = Financial

Domain-Specific Risk-Taking (Adult) Scale – Risk Perceptions

People often see some risk in situations that contain uncertainty about what the outcome or consequences will be and for which there is the possibility of negative consequences. However, riskiness is a very personal and intuitive notion, and we are interested in **your gut level assessment of how risky each situation or behavior is.**

For each of the following statements, please indicate **how risky you perceive** each situation. Provide a rating from *Not at all Risky* to *Extremely Risky*, using the following scale:

1- Not at all risky
2- Slightly risky
3- Somewhat risky
4- Moderately risky
5- Risky
6- Very risky
7- Extremely risky

Statements	Extremely Unlikely						Extremely likely
1. Betting a day's income at the horse races. (F)	1	2	3	4	5	6	7
2. Investing 10% of your annual income in a moderate growth mutual fund. (F)	1	2	3	4	5	6	7
3. Betting a day's income at a high-stake poker game. (F)	1	2	3	4	5	6	7
4. Investing 5% of your annual income in a very speculative stock. (F)	1	2	3	4	5	6	7
5. Betting a day's income on the outcome of a sporting event. (F)	1	2	3	4	5	6	7
7. Investing 10% of your annual income in a new business venture. (F)	1	2	3	4	5	6	7

Note. F = Financial

THANK YOU FOR YOUR PARTICIPATION!

Appendix B Turnitin Report

goh2_team

ORIGINALITY REPORT

3%
SIMILARITY INDEX

1%
INTERNET SOURCES

3%
PUBLICATIONS

%
STUDENT PAPERS

PRIMARY SOURCES

1 Mary Jane Duque, Caroline Turla, Lucille Evangelista. "Effects of Emotional State on Decision Making Time", Procedia - Social and Behavioral Sciences, 2013
Publication
1%

2 Jessica D. Burdick, Amanda L. Roy, C. Cybele Raver. "Evaluating the Iowa Gambling Task as a direct assessment of impulsivity with low-income children", Personality and Individual Differences, 2013
Publication
1%

3 A. Irving, T. S. Bowles. "Paper 10: The Importance of Driver Limitations in Vehicle Control", Proceedings of the Institution of Mechanical Engineers, Conference Proceedings, 2006
Publication
<**1**%

4 www.frontiersin.org
Internet Source
<**1**%

5 link.springer.com
Internet Source

Appendix C Ethical Clearance

UNIVERSITI TUNKU ABDUL RAHMAN

Wholly Owned by UTAR Education Foundation (Company No. 578227-M)

Re: U/SERC/14/2019

8 February 2019

Dr Chie Qiu Ting
Head, Department of Psychology and Counselling
Faculty of Arts and Social Science
Universiti Tunku Abdul Rahman Jalan
Universiti, Bandar Baru Barat
31900 Kampar, Perak.

Dear Dr Chie,

Ethical Approval For Research Project/Protocol

We refer to the application for ethical approval for your students' research projects from Bachelor of Social Science (Hons) Psychology programme enrolled in course UAPZ3023. We are pleased to inform you that the application has been approved under expedited review.

The details of the research projects are as follows:

	Research Title	Student's Name	Supervisor's Name	Approval Validity
1.	The Effect of Induced Emotions on Investment-related Risk Taking Among Malaysian Undergraduate Students	1. Goh Shaw Heng 2. Goh Kah Hong		
2.	Personality, Self-esteem and Communication Apprehension Among Undergraduate Students in Peninsular Malaysia	1. Ang Jia Xin 2. Teow Xin Yee 3. Ter Chi Pei	Dr Chie Qiu Ting	8 February 2019 – 7 February 2020
3.	The Effect of Perceived Stress and Selfcompassion on Sleep Quality Among Malaysian Undergraduate Students	1. Khoo Seng Long 2. Lim Mee Poh 3. Priscilla Loo En Pei		

The conduct of this research is subject to the following:

(1) The participants' informed consent be obtained prior to the commencement of the research;

(2) Confidentiality of participants' personal data must be maintained; and

(3) Compliance with procedures set out in related policies of UTAR such as the UTAR Research Ethics and Code of Conduct, Code of Practice for Research Involving Humans and other related policies/guidelines.

Kampar Campus : Jalan Universiti Bandar Barat, 31900 Kampar, Perak Dahrul Ridzuan, Malaysia
Tel: (605) 468 8888 **Fax**: (605) 466 1313
Sungai Long Campus : Jalan Sungai Long, Bandar Sungai Long, Cheras, 43000 Kajang, Selangor Darul Ehsan, Malaysia
Tel: (603) 9086 0288 **Fax**: (603) 9019 8868
Website: www.utar.edu.my

Should the students collect personal data of participants in their studies, please have the participants sign the attached Personal Data Protection Statement for records.

Thank you.

Yours sincerely,

Professor Ts Dr Faidz bin Abd Rahman
Chairman
UTAR Scientific and Ethical Review Committee

c.c   Dean, Faculty of Arts and Social Science
        Director, Institute of Postgraduate Studies and Research

Appendix D SPSS Output Results

Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
Total_happy emotions	Based on Mean	.209	1	78	.649
	Based on Median	.132	1	78	.718
	Based on Median and with adjusted df	.132	1	77.950	.718
	Based on trimmed mean	.152	1	78	.698
Total_sad emotions	Based on Mean	14.933	1	78	.000
	Based on Median	16.512	1	78	.000
	Based on Median and with adjusted df	16.512	1	75.954	.000
	Based on trimmed mean	16.367	1	78	.000

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Total_happy emotions	Equal variances assumed	.209	.649	10.514	78	.000	4.80000	.45654	3.89110	5.70890
	Equal variances not assumed			10.514	77.887	.000	4.80000	.45654	3.89108	5.70892
Total_sad emotions	Equal variances assumed	14.933	.000	-10.615	78	.000	-4.12500	.38860	-4.89864	-3.35136
	Equal variances not assumed			-10.615	66.817	.000	-4.12500	.38860	-4.90069	-3.34931

Descriptives

	Music			Statistic	Std. Error
Total_happy emotions	Happy	Mean		10.6750	.32892
		95% Confidence Interval for Mean	Lower Bound	10.0097	
			Upper Bound	11.3403	
		5% Trimmed Mean		10.7222	
		Median		11.0000	
		Variance		4.328	
		Std. Deviation		2.08028	
		Minimum		6.00	
		Maximum		14.00	
		Range		8.00	
		Interquartile Range		3.00	
		Skewness		-.423	.374
		Kurtosis		-.616	.733
	Sad	Mean		5.8750	.31661
		95% Confidence Interval for Mean	Lower Bound	5.2346	
			Upper Bound	6.5154	
		5% Trimmed Mean		5.8333	
		Median		6.0000	
		Variance		4.010	
		Std. Deviation		2.00240	
		Minimum		3.00	
		Maximum		10.00	
		Range		7.00	
		Interquartile Range		3.00	
		Skewness		.019	.374
		Kurtosis		-.877	.733
Total_sad emotions	Happy	Mean		2.6000	.21122
		95% Confidence Interval for Mean	Lower Bound	2.1728	
			Upper Bound	3.0272	
		5% Trimmed Mean		2.3889	
		Median		2.0000	
		Variance		1.785	
		Std. Deviation		1.33589	
		Minimum		2.00	
		Maximum		7.00	
		Range		5.00	

	Interquartile Range		.75	
	Skewness		2.492	.374
	Kurtosis		5.434	.733
	Mean		6.7250	.32618
	95% Confidence Interval for Mean	Lower Bound	6.0652	
		Upper Bound	7.3848	
	5% Trimmed Mean		6.7778	
	Median		7.0000	
	Variance		4.256	
Sad	Std. Deviation		2.06295	
	Minimum		3.00	
	Maximum		10.00	
	Range		7.00	
	Interquartile Range		3.75	
	Skewness		-.422	.374
	Kurtosis		-1.002	.733

Test of Homogeneity of Variances

Risk taking (Section D)

Levene Statistic	df1	df2	Sig.
.000	2	117	1.000

ANOVA

Risk taking (Section D)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.000	2	.000	.000	1.000
Within Groups	17.325	117	.148		
Total	17.325	119			

Music * Risk taking (Section D) Cross tabulation

			D1		Total
			Low risk	High risk	
Music	No music	Count	33	7	40
		Expected Count	33.0	7.0	40.0
	Happy	Count	33	7	40
		Expected Count	33.0	7.0	40.0
	Sad	Count	33	7	40
		Expected Count	33.0	7.0	40.0
Total		Count	99	21	120

Multiple Comparisons

Dependent Variable: Risk taking (Section D)

Tukey HSD

(I) Music	(J) Music	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
No music	Happy	.000	.086	1.000	-.20	.20
	Sad	.000	.086	1.000	-.20	.20
Happy	No music	.000	.086	1.000	-.20	.20
	Sad	.000	.086	1.000	-.20	.20
Sad	No music	.000	.086	1.000	-.20	.20
	Happy	.000	.086	1.000	-.20	.20

Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
Total_Risk taking (Section E)	Based on Mean	1.503	2	117	.227
	Based on Median	1.455	2	117	.238
	Based on Median and with adjusted df	1.455	2	110.453	.238
	Based on trimmed mean	1.514	2	117	.224
Total_Perception (Section F)	Based on Mean	.840	2	117	.434
	Based on Median	.694	2	117	.501
	Based on Median and with adjusted df	.694	2	112.145	.502
	Based on trimmed mean	.766	2	117	.467

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Total_Perception (Section F)	Between Groups	32.150	2	16.075	.605	.548
	Within Groups	3106.775	117	26.554		
	Total	3138.925	119			
Total_Risk taking (Section E)	Between Groups	11.817	2	5.908	.255	.776
	Within Groups	2716.175	117	23.215		
	Total	2727.992	119			

Test of Homogeneity of Variances

Total_Risk taking (Section E)

Levene Statistic	df1	df2	Sig.
1.503	2	117	.227

Descriptives

Total_Risk taking (Section E)

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
No music	40	21.0250	5.53074	.87449	19.2562	22.7938	11.00	35.00
Happy	40	20.4000	4.70570	.74404	18.8950	21.9050	9.00	29.00
Sad	40	21.1000	4.11252	.65025	19.7848	22.4152	12.00	29.00
Total	120	20.8417	4.78793	.43708	19.9762	21.7071	9.00	35.00

Multiple Comparisons

Dependent Variable: Total_Risk taking (Section E)

Tukey HSD

(I) Music	(J) Music	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
No music	Happy	.62500	1.07739	.831	-1.9326	3.1826
	Sad	-.07500	1.07739	.997	-2.6326	2.4826
Happy	No music	-.62500	1.07739	.831	-3.1826	1.9326
	Sad	-.70000	1.07739	.793	-3.2576	1.8576
Sad	No music	.07500	1.07739	.997	-2.4826	2.6326
	Happy	.70000	1.07739	.793	-1.8576	3.2576

ANOVA

Total_Risk taking (Section E)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	11.817	2	5.908	.255	.776
Within Groups	2716.175	117	23.215		
Total	2727.992	119			

Total_Risk taking (Section E)

Tukey HSD

Music	N	Subset for alpha = 0.05
		1
Happy	40	20.4000
No music	40	21.0250
Sad	40	21.1000
Sig.		.793

Means for groups in homogeneous subsets
are displayed.

a. Uses Harmonic Mean Sample Size =
40.000.

Test of Homogeneity of Variances

Total_Perception (Section F)

Levene Statistic	df1	df2	Sig.
.840	2	117	.434

ANOVA

Total_Perception (Section F)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	32.150	2	16.075	.605	.548
Within Groups	3106.775	117	26.554		
Total	3138.925	119			

Descriptives

Total_Perception (Section F)

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
No music	40	25.9500	5.15379	.81489	24.3017	27.5983	12.00	34.00
Happy	40	25.7750	5.68167	.89835	23.9579	27.5921	6.00	37.00
Sad	40	26.9500	4.56267	.72142	25.4908	28.4092	14.00	36.00
Total	120	26.2250	5.13591	.46884	25.2966	27.1534	6.00	37.00

Total_Perception

Tukey HSD (Section F)

Music	N	Subset for alpha = 0.05
		1
Happy	40	25.7750
No music	40	25.9500
Sad	40	26.9500
Sig.		.566

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 40.000.

Group Statistics

	Music	N	Mean	Std. Deviation	Std. Error Mean
Time	Happy	40	30.1050	11.15301	1.76345
	Sad	40	41.8800	27.80093	4.39571

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Time	Equal variances assumed	9.485	.003	-2.486	78	.015	-11.77500	4.73625	-21.20414	-2.34586
	Equal variances not assumed			-2.486	51.236	.016	-11.77500	4.73625	-21.28235	-2.26765