

# The Role of Emotional States on Purchase Decision-Making among Novice Stock Investors

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**Abstract.** Novice stock investors tend to make investment decisions based on their emotions, so they usually have lower performance. Emotions can affect decision-making through immediate emotions (emotional states) and expected emotions (emotional consequences). Happy and sad are the strongest emotions. Therefore, this research aims to examine and explain the effect of emotional states, specifically happy and sad, on novice stock investors' purchase decision-making. This research uses the experiment method, with 30 novice stock investors divided into three groups (two experimental and one control group). The result shows no effect between happy and sad emotional states on purchase decision-making ( $p > 0,05$ ). The result is caused by participants' tendencies to make rational decisions for the highest utility. The higher the utility they get, the happier they will be, and vice versa. Thus, happy and sad emotions act as expected emotions, not as immediate emotions in decision-making.

**Keywords:** decision making; happy; investors; sad

Indonesia's economic sector experienced a strong downfall at the beginning of the Coronavirus or COVID-19 outbreak in 2020 (Nurmasari, 2020). As a result, many Indonesian citizens have started to realize the importance of reserve funds for unexpected situations by investing in stocks (Tobing et al., 2021). Based on data from PT Kustodian Sentral Efek Indonesia ("Statistik Pasar Modal," 2021), compared to 2019, there was an increase in the number of investors by 56.21% in 2020. The increasing number of investors means that the number of stock investors in Indonesia has increased significantly before and after the Coronavirus outbreak in Indonesia.

Stock investors are divided into novice stock investors and professional stock investors. Novice stock investors are often affected by emotions in making investment decisions and tend to perform lower than professional stock investors because professional stock investors are more likely to make decisions rationally by conducting an in-depth analysis (Holm & Rikhardsson, 2008; Venezia et al., 2011).

Decision-making is choosing an alternative from a group of alternatives (Takemura, 2014). According to Rolls (2014), decision-making is the result of selecting an option from other options, and these options can bring up certain emotions or feelings. Nevertheless, Duque et al. (2013) said that emotion not only appears after making a decision but can also affect the decision-making process. For example, negative emotional states could distort one's cognitive ability to process information and cause one to take longer to decide o

make a decision (Duque et al., 2013). Also, Breaban and Noussair (2018) said that investors in more positive emotional states tend to be braver in making risky investment decisions (risk-seeking).

Based on research from Alquraan, Alqisie, and Al Shorafa (2016), the decision-making process of investors can be explained through two theories, namely, traditional finance theory and behavioral finance theory. In traditional finance theory, investors decide solely based on rational thinking. It can be seen when investors analyze the advantages and disadvantages of their decisions. According to Baker and Ricciardi (2014), someone uses rational considerations in making a decision to get the highest expected utility. The highest expected utility is the maximum utility (personal desire or preference) that someone wants to achieve or obtain. The higher the utility they obtain, the happier that person will be (Kahneman, 2011).

On the other hand, behavioral finance theory says that the decision somebody makes is not just because of rational consideration but can also be affected by emotions and biases. According to Loewenstein and Lerner (2003), emotions can affect decision-making in two ways: expected and immediate. Expected emotions are the emotional consequences of a decision, while immediate emotions are the emotional states felt during decision-making.

An emotional state is a set of feelings arising from a particular activity or circumstance (Pettinelli, 2014). According to Bieg (2013), an emotional state is a temporary emotion that arises due to the effect of a specific situation. One's emotional state has positive and negative feelings (Fenton-O'Creevy et al., 2011). A positive feeling is when someone experiences something good or pleasurable, whereas a negative feeling is when someone experiences something bad or unpleasant (Grizane & Deksnis, 2011).

Based on the previous explanation, this study aims to examine and explain the role of emotional states, especially happy and sad emotions, on novice stock investors' purchase decision-making. This study mainly focused on happy and sad emotions because those two emotions are the strongest (Duque et al., 2013). Therefore, the hypothesis of this study is H1: There is an influence between emotional states (happy and sad) toward purchase decision-making.

## Method

### *Research Design*

This research examined the role of emotional states as the independent variable and purchase decision-making as the dependent variable. There were two experimental groups and one control group, in which participants were randomized through a random assignment. They were subsequently divided into these three groups and received different treatments. Experimental Group 1 received treatment by inducing happy emotions, and Experimental Group 2 received treatment by inducing sad emotions. Meanwhile, the

control group did not receive any treatment. The focus of this research will be explained. First, we only focused on the sad emotional state from the negative feeling dimension and the happy emotional state from the positive feeling dimension. These two emotional states were chosen because happy and sad emotional states have been proven to correspond to investors' purchase decision-making (Breaban & Noussair, 2018). Second, we limited the participants of this experiment to novice stock investors only. Novice stock investors were specifically chosen because professional or experienced stock investors are presumed to make rational purchase decisions by analyzing the stock's performance (Holm & Rikhardsson, 2008; Venezia et al., 2011). Therefore, novice stock investors were chosen as the most suitable participants for this experiment.

### *Participants*

Thirty novice stock investors aged 18-38 (Mean = 22.6 years,  $SD = 4.34$ ) were collected through Indonesian investors' forums and social media. Novice stock investors need to understand the application of fundamental and technical analysis and tend to follow others' behavior when buying stocks (Holm & Rikhardsson, 2008). The sampling technique that was used to get the participants was convenience sampling. The University of Surabaya Ethical Committee has also approved this research. Data collection took place from September to October 2021.

### *Design*

This study uses the experiment method, a basic randomized design comparing two treatments and a control. In this design, participants will be randomly assigned into two experimental groups and one control group. The experimental groups will be given a treatment to evoke a specific emotion (happy or sad), while the control group will get treatment without evoking any emotion (neutral treatment). After receiving treatments, participants will take a post-test (stock market simulation).

### *Materials*

#### *Mood Induction*

This study used video clips as material to induce participants' emotions. The video clip method was chosen because it can reasonably and effectively induce one's emotional state (Zhang et al., 2017). Three video clips were prepared to evoke three conditions (happy, sad, and neutral). The happy video researchers used was entitled "*PECAH BANGET! Kompilasi Raditya Dika Vs Dodit Mulyanto di Atas Panggung – SUCI 4*". This video was about an Indonesian stand-up comedian's funny moments while performing onstage. It was chosen as the happy video because it contained laughing scenes and showed happy expressions (Shevchenko & Bröder, 2019). The sad video was entitled "*Video Thailand Sedih Tentang Ayah KLIK CC untuk Subtitle Indonesia*". This video was about a disabled father who did everything to make his daughter happy, even though his daughter hated his disabilities. It

was chosen because it contained sad stories and scenes of people crying (Shevchenko & Bröder, 2019). As for the neutral treatment, the video was entitled "*Penjelasan Ilmiah Aroma Alami Saat Hujan*". This video was about the scientific explanation of petrichor or the smell of rain. Researchers chose this video because it only contained documentaries or scientific explanations about a phenomenon and did not evoke any emotions (Shevchenko & Bröder, 2019). These videos were approximately 3 minutes long and were obtained from YouTube.

Each video was tested on 5 people with similar backgrounds to the experiment's participants (15 people for 3 videos) to validate that the chosen videos could stimulate the desired emotions. Fifteen people were divided into three groups to watch happy, sad, and neutral videos. Before watching the video, they were asked to rate their emotions with an answer between 1 (very sad) and 10 (very happy). After watching the video, participants were asked to answer the same question again. The score differences between the second and first questions indicate that the videos could stimulate the desired emotions.

#### *Mood Manipulation Check*

Mood manipulation check helps the researchers see whether there are changes in participants' emotions before and after receiving treatment. In this research, the manipulation check was done using a general question about the participant's emotional state ("How do you describe how you feel right now?"). Participants can choose from ten possible choices, ranging from 1 (very sad) to 10 (very happy). A mood manipulation check will be given twice, before and after participants receive the treatment. The changes then can be seen by subtracting those scores.

#### *Stock Market Simulation*

A stock market simulation was prepared to see the purchase decision-making from participants. In this research, researchers use the "StockMarketSim" application that can be downloaded from the "Google Play Store" for free. With this application, participants can buy stocks worldwide with "fake money" and set the amount according to their will.

#### *Measures*

This paper will measure two variables: purchase decision-making (dependent variable) and emotional states (independent variable). Purchase decision-making was measured manually by the number of shares participants bought during the experiment.

On the other hand, emotional states were measured using the Positive And Negative Affect Schedule – Expanded Version (PANAS-X) by Watson and Clark (1994). PANAS-X measures two dimensions of emotional states: positive affect and negative affect. Positive affect consists of joviality, self-assurance, and attentiveness. Negative affect consists of fear, hostility, guilt, and sadness. Each aspect contains words that describe the aspect (e.g., joyful for joviality aspect, etc.). The respondent will be asked to rate the word from 1 (not at all) to 5 (significantly) according to how they felt about the word at the

instructed time (right now, the past week, past months, etc.) (Watson & Clark, 1994). In general, PANAS-X consists of 60 items/words. However, in this research, the participants were only asked to answer the items in joviality (8 items) and sadness (5 items). Joviality (happiness) and sadness were chosen because those two emotional states are the strongest emotions in humans (Duque et al., 2013).

### *Procedure*

First, participants were randomly assigned to one of three groups (happy, sad, or neutral; 10 participants in each group). Afterwards, the participants were asked to join a Zoom Meeting prepared by the researchers. The experiment could not proceed offline because of the COVID-19 pandemic in the research area.

Inside the Zoom Meeting, participants were asked to answer a general question about their feelings/emotional state at that time (before receiving the treatment). After answering the first general question, participants were instructed to watch a video clip based on their previously assigned group (happy, sad, neutral). Participants were instructed to watch the video in full screen with good/clear audio, and not to skip any scenes. Immediately after the mood induction phase, participants were asked to answer the same general question (mood manipulation check) again.

Afterwards, participants were asked to complete the PANAS-X scale to measure their emotional states. PANAS-X scale consists of 60 items to measure multiple emotional states. However, in this research, researchers only used 13 items (8 items joviality, five items sadness) to measure participants' happy and sad emotional states (Watson & Clark, 1994). Participants were instructed to give the score in every word based on their feelings at present, from 1 (not at all) to 5 (extremely).

After completing the PANAS-X scale, participants were instructed to do the stock market simulation. According to their usual investment behavior, participants were allowed to buy, sell, or do nothing. However, researchers gave out five rules to equalize participants' situations before undergoing the experiment. First, the amount of money participants need to set is Rp10,000,000 (around 696 USD). The following rule is that participants can only purchase stocks with a price between Rp100,000 (around 6.96 USD) and Rp1,000,000 (around 69.61 USD) per lot. The third rule is that participants are asked to buy or sell their stocks by multiplying one lot (100 shares). The fourth rule is that participants can only purchase stocks from Indonesia. For the fifth rule, participants cannot change the listed price when buying or selling stocks during the simulations. After giving out the experiment rules, participants were asked to do the simulation for 15 minutes. When they were done, participants were asked to take screenshots of their order history and submit the screenshots via a Google form. Lastly, researchers debriefed the participants and rewarded them for their participation. The experiment lasted for one hour.

## Result

### *Video Clips Try Out*

To ensure that the videos used in this experiment effectively stimulated the desired emotions, researchers conducted a tryout for each video to 15 people with a similar background as the participants. The results are shown in Table 1.

**Table 1.**

*Video Clips Try Out Results*

Videos	N	Condition	Mean	Conclusion
Happy Video	5	Before	6.60	Subject's emotional states are increased from 6.6 (happy) to 8.6 (very happy)
		After	8.60	
Sad Video	5	Before	6.60	Subject's emotional states decreased from 6.6 (happy) to 4 (sad)
		After	4.00	
Neutral Video	5	Before	7.20	Subject's emotional states do not change from 7.2 (happy) to 7.4 (happy)
		After	7.40	

### *Mood Manipulation Check*

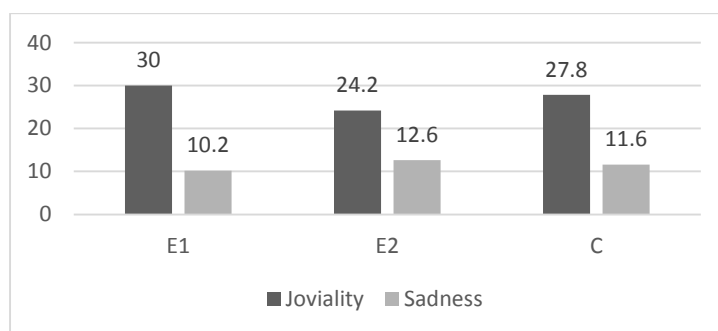
The mood manipulation check was calculated by subtracting the score after mood induction from before mood induction. Table 1 shows participants' mean scores before and after receiving their treatment. After receiving the treatment, the participants in happy conditions felt more positive (from 7.10 or happy to 8.50 or very happy). Participants in sad conditions felt more negative (6.50 or happy, to 4.40 or sad). In contrast, participants in neutral conditions did not significantly change their scores (6.50 or happy to 6.90 or happy). The result shows that the treatments were successful because the happy video made participants feel happier, the sad video made participants feel sadder, and the neutral video did not significantly change participants' emotional states.

**Table 2***Mood Manipulation Check*

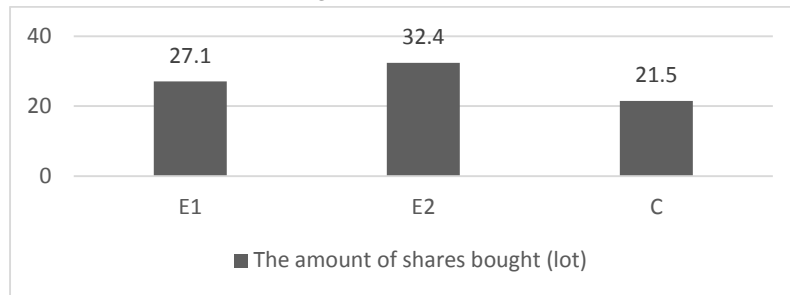
Group	N	Condition	Mean	SD
Experimental group 1 (happy condition)	10	Before	7.10	.876
		After	8.50	1.179
Experimental group 2 (sad condition)	10	Before	6.50	.972
		After	4.40	1.713
Control group (neutral condition)	10	Before	6.50	1.080
		After	6.90	1.370

*Emotional States*

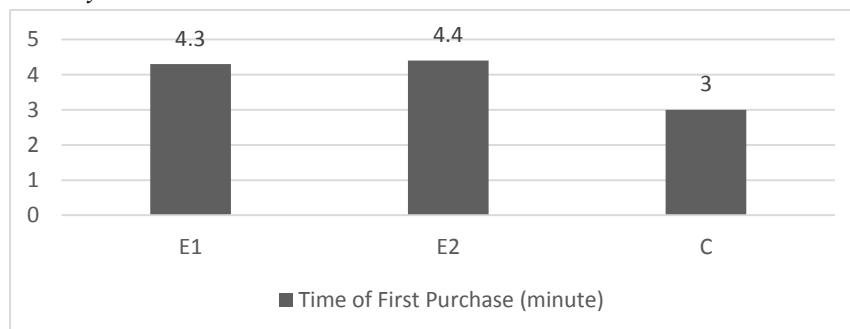
In this research, the PANAS-X scale measured happy and sad emotional states. Figure 1 shows that most participants from all groups (experimental and control groups) tend to be in a stronger, happy emotional state. However, experimental group 2 (the group that watched a sad video) has a higher sadness score than other groups (experimental group 1 and control group). It has a lower joviality score than other groups. Meanwhile, the control group has a lower joviality score than experimental group 1 (the group that watched a happy video) and a lower sadness score than experimental group 2.

**Figure 1.***PANAS-X**Purchase Decision-Making*

After the stock market simulation, purchase decision-making was measured manually by looking at the participant's order history (precisely the number of shares bought). Figure 2 shows that, on average, experimental group 2 bought the most shares during the experiment (32.4 lots), experimental group 1 bought 27.1 lots, and the control group bought the least (21.5 lots).

**Figure 2.***Purchase Decision-Making**Additional Data*

This research not only looks at the number of shares bought but also measures participants' purchase decision-making by looking at their time of first purchase, the number of company stocks bought, and the amount of money used during the experiment. All these data were collected automatically by the "StockMarketSim" application and can be seen in the participant's order history. The data will be presented as follows:

**Figure 3.***Time of First Purchase*

From Figure 3, participants from Experimental Group 2 (sad video) took the longest time to make their first purchase during the experiment (4.4 minutes), followed by Experimental Group 1 (happy video) and Control Group (neutral video).

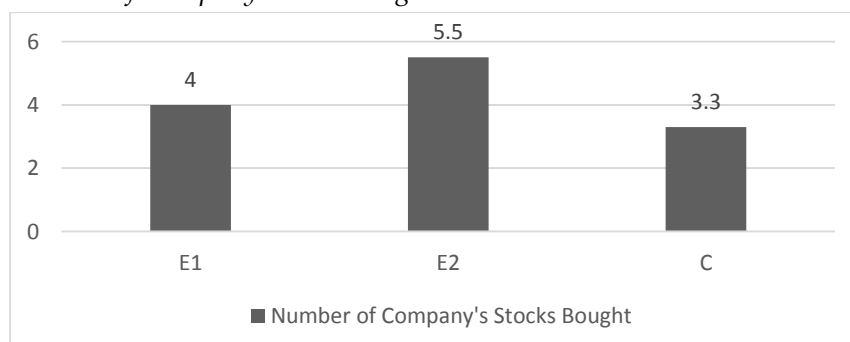
**Figure 4.***Number of Company Stocks Bought*

Figure 4 shows that participants in Experimental Group 2 bought the most company stocks during the experiment (5.5 company stocks), followed by Experimental Group 1 (4 company stocks) and Control Group (3.3 company stocks).

**Figure 5.**

*Amount of Money Used*

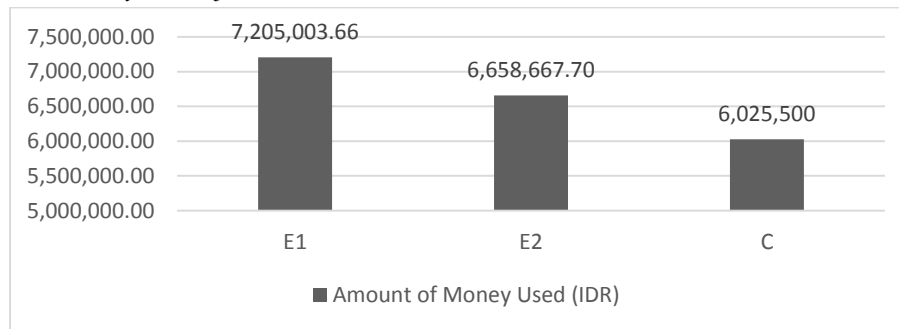


Figure 5 shows the amount of money participants used during the experiment. Participants in Experimental Group 1 used the most money with Rp7,205,003.66 (around 500.56 USD), followed by Experimental Group 2 with Rp6,648,667.70 (around 461.91 USD), and Control Group with Rp6,025,500 (around 418.62 USD).

#### *Supporting Data*

To support our discussion, researchers also asked about participants' considerations while purchasing stocks during the experiment (see Table 3).

**Table 3.**

*Participant's Consideration in Purchasing Stocks During Experiment*

Considerations	Frequency	%
Solely based on emotions/feelings	6	20%
Did an analysis before purchasing	15	50%
Both	9	30%
<b>Total</b>	<b>30</b>	<b>100%</b>

According to Table 2, most participants used analysis to buy their stocks during the experiment (50% of participants). While only 20% of participants bought their stocks solely based on their emotions/feelings, and the remainder answered both.

## Discussion

This research aims to examine and explain the role of emotional states (especially happy and sad) toward purchase decision-making in novice stock investors. Previous studies have found that there are roles between emotional states toward investment behavior (Alquraan et al., 2016). However, no studies specifically examine happy and sad emotional states and their effect on purchase decision-making (by looking at the number of shares purchased). Happy and sad emotions are essential because they are the strongest emotions in humans (Duque et al., 2013).

To analyze the hypothesis, researchers conducted a Kruskal Wallis test on participants' purchase decision-making, as shown in Table 4.

**Table 4.**  
*Kruskal Wallis Test*

Measurement	Kruskal-Wallis H	Df	p
Purchase Decision Making	1.689	2	.430

The result from the hypothesis test shows that statistically, there is no significant effect between emotional states (happy and sad) toward purchase decision-making ( $p > 0.05$ ). This result differs from previous research that says stock investors in a positive emotional state will make more purchases than investors in a negative emotional state (Breaban & Noussair, 2018).

These differences can be explained theoretically and methodologically as well. Theoretically, there is no influence because investors' purchase decision-making can be made not only by behavioral finance theory but also by traditional finance theory. In this research, most participants used rational thinking (traditional finance theory) during the experiment (see Table 2). Even though the participants in this experiment were novice stock investors, Table 2 shows that most participants use rational thinking (analyzing the stocks) before making a purchase decision. According to Baker and Ricciardi (2014), someone uses rational consideration in decision-making to achieve the highest expected utility. The higher the utility they get, the happier they will be, and vice versa (Kahneman, 2011). These feelings of happiness are feelings that arise as a consequence of the decision (expected emotions), not feelings felt when making the decision (immediate emotions) (Loewenstein & Lerner, 2003). From that finding, participants use rational consideration to be happy or satisfied with their decision later (expected emotion). Therefore, happy and sad emotions do not play as immediate emotions (emotional state) but as expected emotions in novice stock investors' purchase decision-making.

Methodologically, the reason why this research hypothesis was rejected could be explained by several causes. The first is because of incongruity between measured emotional states and the desired emotional states from participants. In Figure 1, all participants felt a stronger happy/jovial emotional state than a sad emotional state (including those who watched sad and neutral videos). The result is incongruent with the researchers' expectations because the participants who watched a sad video should feel a stronger sad emotional state, and the participants who watched a neutral video should be balanced between jovial and sad emotional states.

Several things may cause incongruity to occur. The first is the participant's initial emotional states (their emotional states before the experiment), and the second is the treatments' failure to trigger the desired emotional states. For the first cause, the participant's initial emotional state was measured by asking general questions, with choices of answers ranging from 1-2 (very sad), 3-4 (sad), 5-6 (neutral), 7-8 (happy), 9-10 (very happy). The result of this measurement (see Table 1) shows that the mean score of all participants before experimenting was in happy condition (6.5-7). That result showed why most participants felt a stronger happy emotional state despite their varied treatments (happy, sad, and neutral video).

Next, this incongruity can also be caused by the treatment's failure to trigger the desired emotional states. In this experiment, researchers used 3-4-minute video clips as treatments to evoke specific emotional states (happy, sad, neutral). Video clips were the intervention because watching videos effectively induces emotions (Zhang et al., 2017).

Participants were asked to watch the video attentively, with full-screen resolution and adequate audio, and turn their Zoom camera on if possible. However, in the execution, many participants needed help turning on their Zoom cameras. Hence, the researchers could not observe whether or not the participants followed all the instructions when they watched their videos. In addition, Siedlecka and Denson (2019) also said that several methods to induce emotions are the best, such as reading, listening, self-referential statements, and many more (Marcusson-Clavertz et al., 2019). In this experiment, participants' emotions were only induced by one method (watching video clips), so it may not be strong enough to trigger the desired emotions from participants.

Next, the rejection of this research hypothesis could be methodologically explained by the lack of "risk" in the experiment. This experiment uses the StockMarketSim application to measure participants' purchase decision-making. This application allows participants to buy and sell stocks with "fake money." Because participants use "fake money" and have nothing to lose, they might feel there is no risk while buying/selling their stocks and tend to make decisions recklessly during the experiment. Apart from that, it is methodological (experimental). The researcher checked for internal validity, which resulted in the treatment variable not being proven.

To enrich our findings, researchers also conducted additional tests regarding participants' purchase decision-making. Researchers also want to see whether there is an

influence between emotional states towards participants' purchase decision-making by looking at their time of first purchase, the number of company stocks bought, and the amount of money used during the experiment. The result of hypothesis tests based on those additional data will be shown in Table 5.

**Table 5.**

*Additional Hypothesis Test*

No.	Measurement	Kruskal-Wallis H	df	p
1.	Time of first purchase	2.030	2	.362
2.	Company stocks bought	3.535	2	.171
3.	Amount of money used	1.241	2	.538

As presented in Table 4, it can be seen that there is no significant influence between emotional states toward investors' purchase decision-making by looking at their time of first purchase, the number of company stocks bought, and the amount of money used during the experiment ( $p > 0,05$ ). These results differ from the previous analysis (number of shares bought) and could be explained by the same explanations.

However, let us look at the numbers as presented in Figure 3. It can be seen that the participants in Experimental Group 2 (sad video) took a longer time to make their first purchase during the experiment compared to the other groups.

According to Duque et al. (2013), negative emotional states could distort one's cognitive ability to process information. This distortion could be why participants who watched sad videos took the longest to make their first purchase.

The time of first purchase, if we look at the number of company stocks bought and the amount of money spent (Figure 4 and Figure 5), it shows that participants in Experimental Group 1 (happy videos) spent the most money on less company stocks compared to participants in Experimental Group 2 (sad videos). Breaban and Noussair (2018) said that investors in a stronger, happier emotional state tend to be braver in taking risks during decision-making (risk-seeking). One of the forms of risky decision-making in investment is to spend all of our money on fewer stocks (put all our eggs in one basket). Thus, it can be said that participants who felt stronger, happier emotional states tend to be risk-seeking in making their investment decisions.

## Conclusion

Based on previous analysis and discussion, happy and sad emotional states do not affect the purchase decision-making of novice stock investors. Such results can be explained

theoretically and methodologically. Theoretically, participants in this experiment are more likely to make decisions based on rational consideration to achieve their highest expected utility (Baker & Ricciardi, 2014).

According to Kahneman (2011), the highest expected utility is correlated with expected emotions. The higher the utility a person gets, the happier they will be, and vice versa. Thus, in investment settings, happy and sad emotions play a role as expected emotions (emotional consequences from a decision), not as emotional states (emotions felt during decision-making).

Methodologically, this result can be explained by three causes. First is the incongruity between measured emotional states and the desired emotional states from participants, and the second cause is the lack of "risk" in the experiment. For the first cause, this incongruity could occur because the participant's initial emotional states tend to be happier (see Table 1) rather than neutral. Not only that, but the incongruity could also result from the treatments' failure to trigger the desired emotional states from participants.

For the second cause, such a result can be caused by the experiment's lack of "risk" factors. This experiment uses "fake money" to purchase stocks and does not have any reward/punishment for the participant's performance during the experiment. Therefore, participants might become more reckless and need to be more responsible. The last cause is that the researcher checked for internal validity, which resulted in the treatment variable not being proven.

However, if we analyze it based on the numbers, participants in a stronger negative emotional state tend to take longer to make their first purchase decision. On the other hand, participants in a stronger positive emotional state tend to be more risk-seeking in making their investment decisions.

Several limitations in this research need to be underlined. First is the number of participants. This research was only able to experiment on 30 participants, which is the least number of participants to experiment. Second is the experiment schedules that could not be done simultaneously between participants. Although the researchers and participants had already agreed on a particular schedule, some participants could not attend the experiment for various reasons (connection problems, urgent activity, etc.). The experiment not being done at the same time could affect the experiment results.

Third is the inability to observe participants during treatments. Since this experiment was done online (via Zoom meeting), the researchers can only observe participants' behavior if they turn on their cameras. However, many participants could not turn on their cameras in the experiment due to connection problems. Fourth is the inability of treatments to trigger the desired emotional states. This research only uses one method to induce participants' emotional states, using 3-4-minute video clips. According to Siedlecka and Denson (2019), researchers could use or combine two or more different methods to ensure that participants' emotional states are induced.

Fifth is the lack of "risk" in the experiment. Since the participants do not get rewards or punishment for their performance during the experiment, they might feel like there is nothing to lose and make purchase decisions recklessly. Lastly, participants' initial emotional states before the experiment are not neutral (they tend to be stronger in happy emotions) and affect their emotions during or after treatment.

#### *Recommendations*

For future research, we suggest several things to improve the results. The first is to increase the number of participants as much as possible. The higher the number of participants, the better the result will be. Next, if the experiment is conducted online, researchers have to ensure that all participants can turn on their cameras to observe their behaviors during the experiment. It is also recommended that future research add or combine multiple methods for mood induction (audio, visual, etc.) to induce participants' emotions well. Lastly, future research needs to add reward or punishment elements to their experiment so that participants do not act or make decisions recklessly during the experiment.

### **Declaration**

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#### *Authors' Contributions*

JAD designed, conducted the research, and wrote the manuscript draft. The first and second authors performed data analysis and agreed with the final version of this manuscript.

#### *Conflict of Interest*

The author declares that there is no potential conflict of interest in this study.

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