

## The dynamic of decision-making: Effect of intertemporal choice on clothing products

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### ABSTRACT

Individuals' emotional states (i.e., happy and sad emotions) might influence the intertemporal choice process, a decision of choosing between instant alternatives with small advantages or delayed alternatives with enormous benefits, when purchasing a product. This study tested the role of emotional states in individual intertemporal choices, especially when buying clothing products. 45 active students were involved as participants in this experimental study. The results indicated that happy and sad emotions do not significantly differ in individuals' intertemporal choices, specifically in purchasing clothing products ( $\chi^2 = 5.293, p > 0.05$ ). This study also found that intertemporal choice was influenced by gender ( $F = 6.431, p < 0.05$ ). This gender difference was significant ( $\chi^2 = 4.099, p < 0.05$ ), in which female participants had a higher average delayed gratification than male participants. Even though differences in income did not significantly impact the differences in intertemporal choice ( $\chi^2 = 5.962, p > 0.05$ ), individual income influenced intertemporal choice ( $F = 4.381, p < 0.05$ ), in which participants with smaller incomes tended to choose cheaper clothing product. Moreover, the system of three thinking inhibited irrationality and made students more rational when making purchase decisions in accordance with their income or pocket money.

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### Introduction

People often have various choices or alternatives in all their activities which require them to make decisions, including the decision to purchase clothing products. People sometimes choose to purchase new arrival products that tend to have high prices to be up to date with clothing trends. Conversely, they can save up by waiting to purchase some products until the 'discount season' comes. Those describe the phenomenon of intertemporal choice, a process by which individuals make decisions on several alternatives at various times (Camerer et al., 2005). This concept represents an individual's present and future consumption model, which aims to achieve maximum satisfaction throughout his/her life that might be affected by several aspects such as the size, time, risk, and composition of the choices or alternatives (Bota, 2021). The alternatives for intertemporal choice are divided into two types: an alternative that provides instant small rewards or the smaller-but-sooner (SS) option and an option that provides delayed large rewards or a larger-but-later (LL)

option (Zhou et al., 2022). The individuals' tendency to choose the SS option is called immediate gratification, while the inclination to choose the LL alternative is regarded as delayed gratification (Cheng et al., 2012). Intertemporal choice influenced by individual's emotional state in which different emotions can lead to different intertemporal choice tendencies. However, research on the effect of emotions on intertemporal choice revealed different results (Suo et al., 2021). Takemura (2021) found that positive emotions will shorten the duration of the decision-making process, which is related to the activity of system one thinking which operates automatically and quickly, with little or no effort and no sense of voluntary control. Moreover, happiness, one of the positive emotions, can encourage individuals to seek immediate gratification and choose the smaller but sooner (SS) option (Zhou et al., 2022). Negative emotions, on the other hand, will slow the individual's decision-making, as it relies on the individual's system two which is more logical, analytical, conscious and effortful (Takemura, 2021). These negative emotions encourage individuals to delay gratification and choose a larger but later (LL) option (Zhou et al., 2022). However, those differs from the research by (Liu et al., 2013), which found that positive emotions would encourage individuals to do delayed gratification, and negative emotions would encourage immediate gratification.

Based on the explanation above, this research was carried out to test the role of emotional state (happy and sad) in affecting intertemporal choice in purchasing clothing products. This research is important to complement the previous research and become a reference for future research on related topics. This research is also important in providing public knowledge to consumers regarding the role of the emotional state in decision-making, especially in purchasing clothing products as well as helping the clothing producer create a marketing strategy that targets the consumer's emotions, which can influence purchasing decisions. This study is equipped with two research hypotheses, namely:

H1: There is a role difference between happy and sad emotions in immediate gratification.

H2: There is a role difference between happy and sad emotions in delayed gratification.

## Method

### Research Design

This study used an experimental method to examine the role of emotional state on intertemporal choice (Valente & MacKinnon, 2017). There were two experimental groups and one control group, in which participants were randomised through a random assignment, divided into these three groups, and given 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 University of Surabaya Ethics Committee issued the ethical clearance letter, and the number for this experimental research is 104/KE/VIII/2022. See Figure 1.

**Figure 1**

*Experiment Design*



KE 1, KE 2 and KK refer to experimental group 1 (happy group), experimental group 2 (sad group) and control group, respectively.

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### ***Participants***

The study involved forty-five active students (64,4 % Female, *Mean* = 20.47, *SD* = 0.89, range 18-22 years old) recruited from the University of Surabaya, Indonesia. The sampling technique used was non-random convenience sampling, with the criteria of those with experience purchasing H&M products. Data was collected from September 2022 to October 2022, all through several Google Form links and QR codes.

### ***Procedures***

The films and music were tested through offline tryouts during the preparatory stage before the experiment. This tryout was conducted on 20 people to test the ability of film and music to stimulate or induce an emotion by comparing the pretest and posttest about their emotional state check. Based on the tryout it was found that all films and music proved to induce emotions as expected.

All participants who met the criteria were randomised using Excel, divided into three groups (i.e., happy group, sad group and control group), and invited to join the Line group according to their respective groups. The informed consent sheet was then given through the groups, and all participants immediately filled out and sent the informed consent to the researcher. Afterwards, information about the experimental implementation schedule was conveyed to each group. Several things participants needed to prepare, such as gadgets and internet networks, were also conveyed via group chat.

The experiment was conducted offline. The participants were brought together in a class according to their group schedules. The participants sat inside the class, and the researcher then gave a briefing as an introduction. The researcher gave a welcome greeting and thanked the participants for their presence, and then explained the process of the experiment. After the initial instruction, participants were directed to answer the first emotional state check via the QR or Google Form link on the screen. This initial emotional state check was used to eliminate participants who have emotional states in the form of "very sad" (score 1) or "very happy" (score 10) because their initial emotions (before getting treatment) are considered to influence the decision-making process in the experiment.

After the first emotional state check, participants were asked to complete an identity form via a QR scan or the Google Form link in class. While filling out the identity, the music with emotional induction according to their group was played. In experimental group 1 (KE 1), the participants played music that induced happy emotions, and the participants in experimental group 2 (KE 2) played music that induced sad emotions. Music was not played in the control group (KK) class.

After completing the form, the music playing in class was stopped. KE 1 and KE 2 continued watching short films that could induce specific emotions. KE 1 watched films with happy emotions induction, while KE 2 watched films with sad emotions induction. For KK, the participants did not watch any short films.

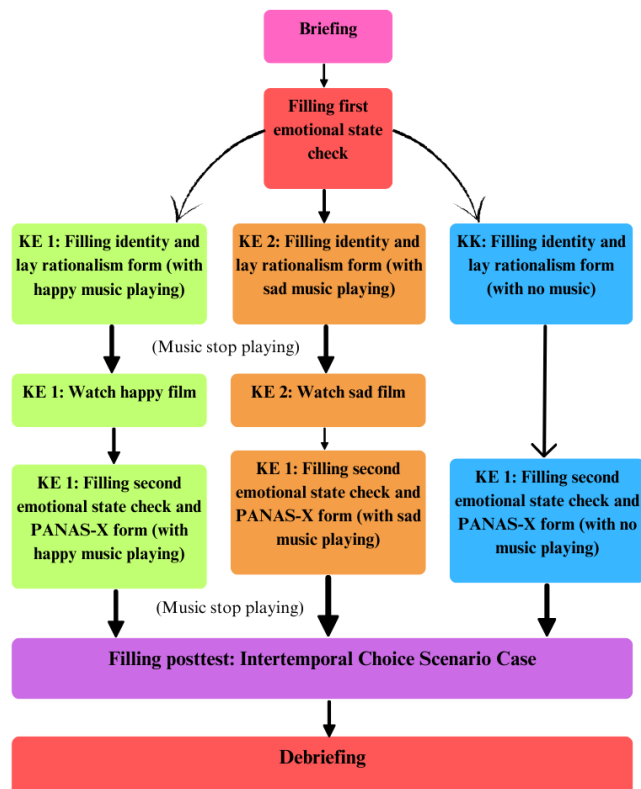
After watching the short film, the whole group filled out the second emotional state check form. Then, participants continued to work on the PANAS-X form. These two forms could be accessed via the QR code or the Google Form link on the screen. During the form-filling, music with emotional induction is played in KE 1 and 2 classes (except in KK).

After participants had filled in these two forms, the music was stopped, and the researcher continued to direct the participants to do the posttest. The posttest used in this study is an intertemporal choice scenario case. The participants were asked to imagine that they were shopping for clothing products, in which they had to choose the price and time of purchase they were most interested in.

The experimental process then continued to the last stage, which was the debriefing stage. At this stage, the researcher gave some information that needed to be conveyed or

clarified, which was used to neutralise the participants' emotions. First, the researcher conveyed that the real purpose of experimental research is to find out how the emotional state influences the participants' decision-making tendencies. In addition, the researcher informed the procedure for withdrawing research data for participants who wanted their data processed only after a while. However, from the three experimental schedules that were carried out, not a single participant wanted to withdraw their data after receiving the debriefing. See [Figure 2](#).

**Figure 2**  
*Experiment Flow Diagram*



### ***Experiment Manipulation***

Happy emotions were induced by a YouTube video entitled "SUCRD - Girls Mastering the Senses," which shows an atmosphere full of laughter and happy expressions, considered capable of inducing happy emotions (Shevchenko & Bröder, 2019). In addition, this study also used the Spotify playlist "Happy songs everyone knows," which contains various songs with fast tempos and significant modes, which are considered capable of inducing happy emotions (Zhou et al., 2022). Sad emotions were induced by a YouTube video entitled "IBU - Short Movie [SAD STORY]," which shows disharmonious relationships and scenes of crying, so it is considered capable of inducing sad emotions (Shevchenko & Bröder, 2019). Besides videos, this study also used the Spotify playlist "sad songs 2022 crying and depressing music", which contains various songs with slow tempos and minor modes, which are considered capable of inducing sad emotions (Zhou et al., 2022).

### ***Instruments***

#### **Emotional State Check**

An emotional state check is one of the experiment materials (in the form of a Google Form) useful for knowing participants' emotional states during the experimental process.

This form only determines the participant's emotional state through one question ("If you were asked to describe your current feelings, what would you choose?"). Response options include very sad (1 to 2), sad (3 to 4), neutral (5 to 6), happy (7 to 8), and very happy (9 to 10). This emotional state check was given twice before and after the treatment. This instrument was used to identify the changes in the participants' emotional states before and after the treatment.

#### PANAS-X

The expanded version of Positive and Negative Affect Schedule with (PANAS-X) created by (Watson & Clark, 1999) provided in a Google Form, was used to measure the participants' emotional state. This scale measures 11 individual emotional states in 60 statement items. Of the 11 emotional states, this study only used data on items that describe happy emotions, namely joviality items (8 items), and those that describe sad emotions, namely sadness items (5 items). The subject matter expert gave the content validity of PANAS-X. This instrument also has internal consistency with Alpha Cronbach's score of 0.971 for positive affect and 0.972 for negative affect (reliable).

Statements on joviality items consist of happy, joyful, cheerful, delighted, energetic, enthusiastic, excited, and lively (Watson & Clark, 1999). Meanwhile, sadness consists of being alone, blue, downhearted, lonely, and sad. Participants were asked to give scores from 1 (Not at all), 2 (Slightly), 3 (Moderate), 4 (Excellent), to 5 (Very). Then, all the answers on the emotional aspects of joy (happy emotions) and sadness (sad emotions) items from the participants were calculated. The total score for the emotional aspects of joy ranged from 8 to 40, while the total score for the emotional aspects of sadness ranged from 5 to 25. Different from emotional state checks, which focused on knowing emotional changes before and after the treatment, this instrument was addressed to collect scores obtained by participants on certain emotional aspects, the stronger these emotions are felt by participants (Watson & Clark, 1999).

#### Intertemporal Choice Scenario Case

Based on the participants' decision, the intertemporal choice assessed using 18 purchase clothing products scenario case items with two choices presented: immediate or delayed rewards, which were delivered via Google Form questionnaire as posttest. This instrument has internal consistency with Alpha Cronbach's 0.760 (reliable) and content validity that determined by subject matter experts.

#### Figure 3

*Intertemporal Choice Scenario Case's Item*



- Buy new arrival for IDR 549.900
- Buy 60 days later for IDR 300.000

### Data Analysis

The study involved forty-five active students (64,4 % Female,  $Mage = 20.47$ ,  $SD = 0.89$ , range 18-22 years old) recruited from the University of Surabaya, Indonesia. The sampling technique used was non-random convenience sampling, with the criteria of those with experience purchasing H&M products. Data was collected from September 2022 to October 2022, all through several Google Form links and QR codes.

#### Kruskal-Wallis

The hypothesis was tested through Kruskal Wallis to see whether there is a significant difference in intertemporal choices among the experimental and control groups (Brabar et al., 2021). This test conducted to examine whether different emotions affecting the participants' tendency to make intertemporal choices. The alternative hypothesis (H1 and H2) would be accepted if the p-value  $< 0.05$ , and vice versa.

#### ANACOVA

This study used ANACOVA as an additional data analysis test. Besides comparing the mean between groups, ANACOVA calculates the correlation with other variables. In ANACOVA, the independent variable can interact with the controlled variable or the covariate. The test was conducted to compare the participants' intertemporal choices regarding their emotional states while connecting the intertemporal choice with other variables, such as sex, age, and monthly income. If the p-value  $> 0.05$ , the test shows no statistically significant interaction between the independent and covariates in their effect on the dependent variables.

### Results

The demographic data of the participants of this study are presented in Table 1, which consists of sex, age, monthly income, and purchasing priority.

**Table 1**  
*Participants' Demographic Data*

	Category	Frequency	Percentage
Sex	Male	16	35.6%
	Female	29	64.4%
Age	18	1	2,2%
	19	7	15,6%
	20	9	20%
	21	26	57,8%
	22	2	4,4%
Monthly Income	< 500.000	9	20%
	500.000-1.000.000	10	22,2%
	1.000.000-1.500.000	5	11,1%
	1.500.000-2.000.000	7	15,6%

**Table 1**  
(Continued)

	Category	Frequency	Percentage
Monthly Income	> 2.000.000	14	31,1%
	Food	29	64,4%
Purchasing Priority	Clothing products	6	13,3%
	College needs	6	13,3%
	Gadget	1	2,3%
	Savings	1	2,3%
	Urgent needs	2	4,4%

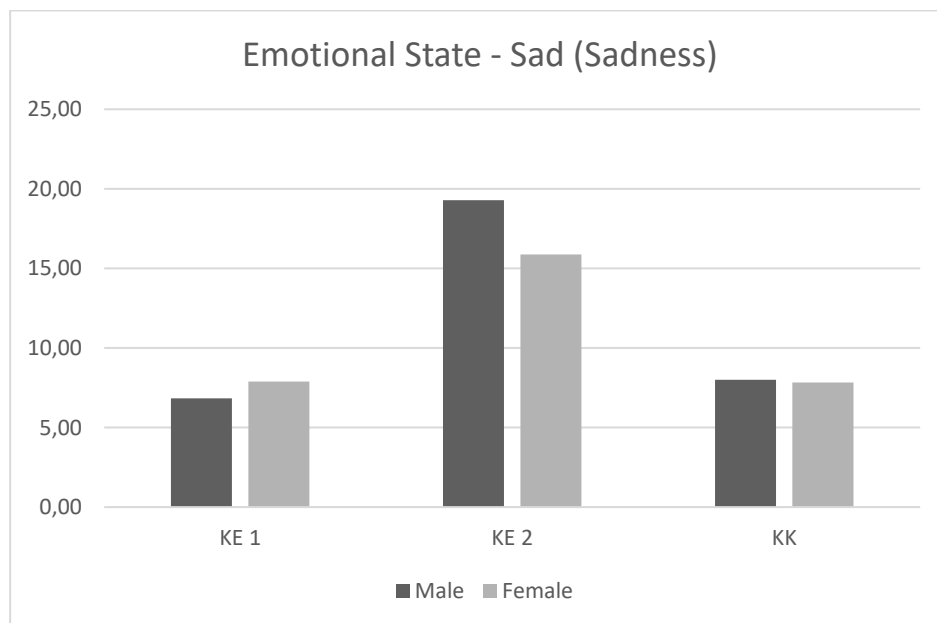
Table 1 shows that 64.4% of participants were female, and 57.8% in 21 years old. Most participants' income (per month) is below Rp 2,000,000.00 (68.9%), and the participants are active students. Besides that, it is also known that most participants choose food as their purchasing priority (64.4%). There are only 6 participants who prioritise the purchase of clothing products, which is the topic of this experimental research.

Participants completed several forms, including PANAS-X and intertemporal choice scenario case. The results of measuring emotional state with PANAS-X show the level of happy and sad emotions participants felt. The following is a depiction of the results:

**Figure 4**  
*Average Emotional State – Happy Emotions (PANAS-X)*



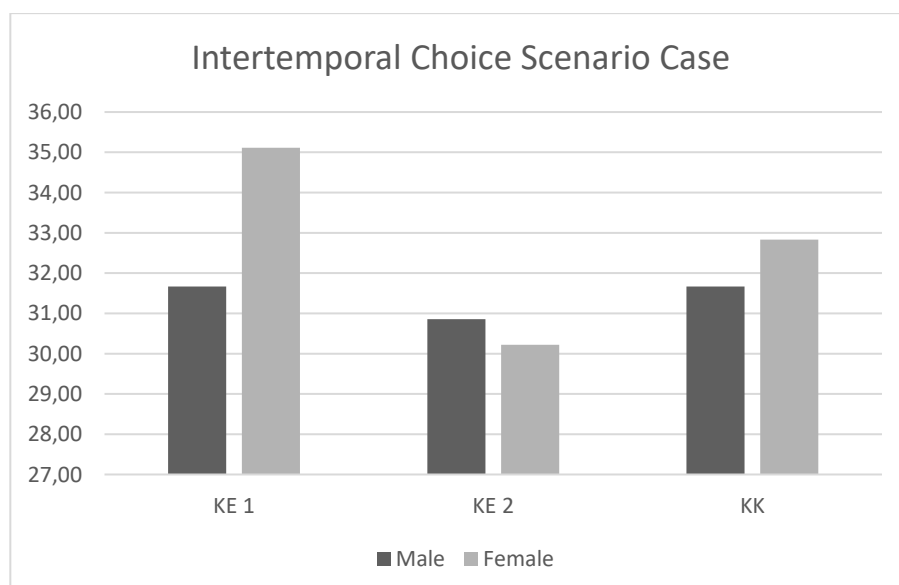
**Figure 5**  
Average Emotional State – Sad Emotions (PANAS-X)



Based on [Figure 4](#) and [Figure 5](#), the average emotional state of participants in the experimental groups followed the induction of emotions. KE 1, which received treatment with happy emotions, showed a higher Joviality score than KE 2 and KK, meaning they experienced happy emotions more than the other groups. Meanwhile, KE 2, which received treatment with sad emotions, showed a higher Sadness score than KE 1 and KK, meaning they experienced sad emotions higher than the other groups.

In addition, participants' intertemporal choice tendencies are divided into three categories: immediate gratification, delayed gratification, and immediate and delayed gratification. The following is a depiction of the results:

**Figure 6**  
Average Score of Intertemporal Choice Scenario Case 'Posttest'





**Table 2**  
*Intertemporal Choice Categories*

Category	Frequency	Percentage
Doing delayed gratification	37	82,22%
Doing delayed gratification and immediate gratification	8	17,78%
Doing immediate gratification	0	0%

Based on the three categories of intertemporal choice, [Table 2](#) shows that none of the participants was categorised as doing immediate gratification (H1 cannot be analysed). Most participants were categorised as having delayed gratification (82.2%).

[Figure 6](#) shows that the average intertemporal choice score of participants in KE 1 (happy emotions) showed a tendency to do delayed gratification, which was higher than in KE 2 and KK. KE 2 (sad emotions) has the lowest average intertemporal choice score. In addition, it can also be seen that female participants had a higher average intertemporal choice score than male participants, who tend to do more delayed gratification.

Furthermore, Kruskal-Wallis's test was conducted using SPSS 26.0 to test H2 ("There is a role difference between happy and sad emotions in delayed gratification") because no participant is categorised as doing immediate gratification (see [Table 2](#)).

The results t showed that the p-value is 0.071 ( $\chi^2 = 5.293$ ;  $p > 0.05$ ), and there was no significant role of emotional state (happy emotions and sad emotions) on intertemporal choice, especially in purchasing clothing products (H2 rejected).

Additional tests were also conducted, including the ANACOVA and Kruskal Wallis tests to some measurement tool data and participants' demographic data.

**Tabel 3**  
*ANACOVA Test*

Measurement	<i>F</i>	<i>Sig</i>
Emotional State (Jovialty and Sadness)	0.361	0.552
Sex	6.431	0.016
Age	0.604	0.442
Monthly Income	4.368	0.044

Based on [Table 3](#), the ANACOVA test showed no significant effect of emotional state and age on participants' intertemporal choice ( $p > 0.05$ ). However, participants' sex and monthly income significantly influenced individuals' intertemporal choice ( $p < 0.05$ ).

Kruskal Wallis test was then conducted to see the difference in intertemporal choice between several categories of sex, monthly income, and age. Based on [Table 4](#), the Kruskal Wallis test results show no significant difference in intertemporal choice between participants' income and age groups ( $p > 0.05$ ).

**Tabel 4**  
*Kruskal Wallis Test*

Measurement	<i>Kruskal-Wallis H</i>	<i>df</i>	<i>p</i>
Sex	4.099	1	0.043
Monthly Income	5.962	4	0.202
Age	2.537	4	0.638

However, there is a significant difference in intertemporal choice between participants' sex ( $p < 0.05$ ) between female and male participants, in which female participants, on average, tended to do delayed gratification (see [Figure 6](#)).

## Discussion

This experimental research aims to test the role of emotional states (happy and sad emotions) in affecting individual intertemporal choice, specifically in purchasing clothing products. Previous research found that positive emotions increase impulsivity in decision-making where individuals tend to do immediate gratification. Conversely, negative emotions encourage individuals to do delayed gratification ([Takemura, 2021](#); [Zhou et al., 2022](#)). However, research needs to examine the role of these emotional states in decision-making when buying clothing products that illustrate the phenomenon of intertemporal choice.

This study has two hypotheses examining the role of happy and sad emotions on the tendency of intertemporal choice between immediate and delayed gratification. However, hypothesis 1 was not analysed because no one choose immediate gratification. Nevertheless, on the hypothesis test of H2, it is known that there was no significant difference between happy and sad emotions on the tendency of participants to do delayed gratification, so the research hypothesis was rejected. This suggests that participants tended to have low risk-seeking tendencies and high loss aversion, which make participants avoid losses because losses have more 'impact' than gains on individuals ([Tversky & Kahneman, 1992](#)). The success in avoiding the 'risk' of loss will be considered as 'gain' ([Takemura, 2021](#)). In addition, participants tended to choose alternative clothing products with lower prices, even though they had to delay their acceptance, which showed the phenomenon of delayed gratification ([Zhou et al., 2022](#)).

This study showed that emotion did not impact intertemporal choice (decision), which aligns with ([Houdé, 2019](#)) that emotional states is influenced by system three thinking, which has the ability to inhibit the role of emotions in the system one thinking process and diverting it in system two, which is based on reasoning. System three thinking is the metacognitive system responsible for correcting bias from stereotypes, perceptual matching, and particular belief biases. When an individual experiences mental conflict, system three thinking will take a few times to block the intuition of system one thinking, and then the individual can express his/her actual logical capacities. Individuals who are initially emotional and want immediate gratification to get a small reward will be encouraged to do delayed gratification, which brings a large delayed reward. According to ([Houdé, 2019](#)), system three thinking prevents people from bias and heuristics and leads individuals to use actual logical capacities and make people doubt their emotions, consider system one thinking response, inhibit impulsive response, and respond differently. This result indicates that participants' emotional states resulting from the induction of treatment emotions might be inhibited by system three thinking. Thus, the emotions evoked from watching movies

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and listening to music could not influence the participants' decision-making process. Moreover, as the participants' system two thinking became active, it helped them to do delayed gratification related to financial activities (purchasing clothing products), which is considered a more rational decision-making process (He, 2023).

Furthermore, intertemporal choice is also influenced by prioritising the types of products purchased. The findings indicated that the majority of participants prioritised their spending on food, whereas only small number of them prioritised their spending on clothes. The small number of participants who prioritise purchasing clothing products indicates a low level of fashion involvement among the participants. Fashion involvement shows individual attachment to fashion-related concepts, including awareness, reaction, interest, and knowledge (Dhurup, 2014). That can directly or indirectly influence impulse purchasing (Liapati et al., 2015). Low fashion involvement in most of these participants might creates a tendency to avoid impulsive buying of fashion products, or in other words, not to do immediate gratification. Moreover, COVID-19 is considered to have impacts on consumers' socio-economic status, including customer purchase behavior in which people prioritise their spending on primary needs. Past research found that There was an increase of more than 40% in the need to buy food before the COVID-19 era meanwhile, the need to buy clothes for students decreased by around 25% from before the COVID-19 era (Utari et al., 2020)

We also found that income of participants with the status of primarily unemployed students affected the tendency of their intertemporal choice. Kruskal Wallis test shows no difference between several monthly income ranges with the intertemporal choice tendency. The difference is caused by most participants having an income below Rp 2,000,000 which is less than the average monthly income of Indonesians. Theoretically, economic circumstances influence individual intertemporal choices (Mishra & Sharestha, 2019) Research by (Hanum, 2017) found a positive relationship between the amount of student income and there found a positive relationship between the amount of student income and their consumption behavior. The post-test intertemporal choice scenario case used in this study shows a wide selection of clothing products at a high price compared to the participant's income. The finding differs from research by (Mani et al., 2013; Oshri et al., 2019), who found that poverty is associated with decision-making preferences for immediate gratification as an impact of cognitive overload.

In addition, we found that sex significantly influences participants' intertemporal choice. The Kruskal Wallis test result showed that male and female participants significantly differ in intertemporal choice. Based on the average, the tendency to do delayed gratification is higher in female than male participants. This align with (McLeish & Oxoby, 2007) that found that female participants have a higher level of patience when making decisions, whereas male participants will make decisions that seem more significant now. The study also found positive emotions that reduce impulsivity and increase the self-control of female participants, making them more focused on long-term goals. Following what happened in happy experient group, female participants who received treatment with induced happy emotions had the highest average intertemporal choice, which means they tend to have delayed gratification when experiencing happy emotions.

Although the research hypothesis cannot be proven statistically, happy group has the highest average for delayed gratification based on the post-test results. In contrast, sad group showed the lowest average for delayed gratification. Based on the emotional state induced through treatment according to the group, it is known that sad emotions have a more decisive influence on immediate gratification than the influence of happy emotions. Achar et al., (2016) found that impulsivity when purchasing will increase when feeling sad and ultimately lead individuals to immediate gratification which the result was consistent with sad experient group which did delay gratification less than happy group.

We did not measure the participants' initial emotional state before to treatment, which may have affected the treatment's potential to produce emotions in the subsequent steps of the experimental process. Further study needs to measure the participants' initial emotional state prior to the treatment to ensure that the difference in the participants' emotional state is influenced by the treatment.

## Conclusion

This experimental research found that happy and sad emotions did not significantly differ in individuals' immediate and delayed gratification tendencies, especially when buying clothing products. Based on the post-test average, participants chose the alternative of buying the product at a lower price despite waiting some time to purchase. The role of emotional state induced in this study became insignificant because the participants used system three thinking. System three thinking inhibited system one thinking, so the emotional states could not affect the decision-making process. Then, system two thinking is activated to encourage participants to make rational decisions and make participants avoid detrimental immediate gratification alternatives and choose delayed gratification alternatives because they are considered the most rational.

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## Declarations

**Author contribution.** First author contributed to designing the study, collecting data, and writing the draft manuscript. Second author contributed to supervising study design, consulting data analysis, reviewing manuscripts, and finalizing manuscripts .

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**Conflict of interest.** The authors declare no conflict of interest.

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