

Emotion Regulation Strategies: The Effect on Emotional Exhaustion, Emotional Control, and Heart Rate

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Abstract—The study of emotion regulation topic generally associated with the reappraisal strategy that may be offered a positive impact, rather than suppression strategy which affect negatively. This experimental study constituted the manipulation of disgusting video towards three groups (reappraisal strategy vs. suppression strategy vs. watch the movie group). This study has been conducted to 82 participants that conclude by reappraisal strategy was regarded as the most emotionally exhausting, compared with suppression and watch group. The highest emotional control was performed by reappraisal participants. Moreover, the disgusting feeling was felt strongest by the reappraisal group, compared with the suppression group which assessed positively when offered the negative stimulus. However, there was no difference in the influence of disgust video towards the heart rate among the three groups, either before and after the video display. The result of this study provided the remarkable discovery in depicting that emotion regulation can be influenced by people's culture in expressing certain feelings.

Keywords—emotion regulation, reappraisal, suppression, emotional exhaustion

I. INTRODUCTION

Imagine yourself seeing the amputation process from the person who experienced work accident. Some of you might be disgust and fear, but on another side, you must perform the proper attitude in experience your emotion in front of other people. This strategy sometimes uses cognitive change or emotion suppression. Which one of these approaches is more effective to face this condition?

Catterson, Eldesouky, and John [1] stated that every individual would shape and express the appropriate emotion such as fear or disgust, it is a social function when people experience a certain condition. The emotional experience arises when the first dating causes the anxiety feeling or getting the achievement, and nobody knows to cause a happy feeling. This phenomenon is always experienced by everyone, and it can be showed or expressed according to the fact or phenomenon that happen in their life. In several circumstances, every person need emotional regulation strategy towards the real emotion they feel.

Tugade and Fredrickson [2] revealed that emotion regulation refers to an effort to influence an individual's emotion when facing certain situations and how to express inappropriate way. According to Thompson [3] explained that emotion regulation is defined as an external and internal

process in regulating, monitoring, evaluating and modifying the emotional reaction to achieve a particular aim. Koole [4] stated that there are three aspects related to emotion regulation. Firstly, emotion regulation relates to how the individual management responds to others emotional condition, including mood, stress, and positive and negative influence. Secondly, this relates to the spontaneous response from emotion. Thirdly, the emotion diversion when the unexpected condition is happening. Parrot [2] stated that one of several efforts we can perform during emotion regulation process is controlling the antecedent factors.

Emotional regulation is emotion management started from understanding what kind of emotion that emerge, when it occurs and how we express inappropriate way. Gross [5] defined emotion regulation is the process by which individual influence which emotion they have, when they have it, and how they experience and express these emotions. In the process model of emotion regulation, in addition, Gross [5][6][7] stated that individual's emotion regulation consists of five stages: situation selection, situation modification, attentional deployment, cognitive change, and response modulation. In the daily activity, someone can use several emotion regulation strategies in order to adapt in a specific condition.

Situation selection refers to an action, to approach or avoid the certain stimulus that causes particular emotion. Situation modification refers to an action to change the situation that can affect someone's emotion. Moreover, attention deployment refers to attention diversion to another stimulus from the current condition. Cognitive change is the cognitive transformation in noticing a particular event from a different perspective. Another form of cognitive change is a reappraisal. The last strategy is response modulation, used to conceal the real emotion. The form of response modulation is suppression.

This experimental study will measure several effects caused by these two strategies: reappraisal and suppression. Some previous studies have explained the negative effects from negative emotion like anger or disgust, one of the impacts was emotional exhaustion [8][9]. Emotional exhaustion usually related to suppression strategy, while reappraisal technique enables to emerge positive effects towards subjective well-being. Suppression strategy is regarded bring the negative impact because of its feature in pressing and concealing the real emotion. In contrast, the reappraisal strategy is viewed offering the benefits because

people can apply their cognitive function in exploring different point of view.

This study replicated the influence of emotional regulation strategy to decrease the negative emotion, emotional exhaustion and physiological response developed from the previous research by Gross [5]. The participants of this study consisted of three groups; reappraisal, suppression and watch group. Each of the groups was given similar video treatment, except for the instruction to regulate the emotion.

II. METHOD

A. Participants

The participants of this study consisted of 85 collage students from several universities in Makassar City. The average of participants' age ranged from 19 – 21 years old (48 males). From 85 subjects, there were three subjects eliminated and remained 82 participants. These subjects were divided into three categories; reappraisal, suppression and watch group.

B. Research Design

Experiment method of this study consisted of two forms, pretest-posttest between subject and posttest only between subject. In analyzing emotional regulation strategy towards emotional condition and physiological response used pretest-posttest between-subject design.

C. Material

1) *Informed Consent*. Informed consent is the subject's participation statement form in the study for voluntary. Informed consent contained purpose and research procedure and also participant's right whether they can join or not. The party who has a responsibility if the study will cause a negative effect on the participants also explained in the informed consent. The participant's agreement to enroll the experiment is marked by the signature in the form:

2) *Emotional State scale*. Emotional condition assessment contained the statement about how much the participants felt happiness, disgust, and fear before and after watching the video. Moreover, participants' assessment of the emotional condition consisted of three options and ranged from 1 (strongly not felt) to 5 (strongly felt). Assessment sample of the emotional condition before watching the video was "Please give the assessment to emotional regulation that represents your feeling currently: Happy."

3) *Emotional Exhaustion scale*. The emotional exhaustion appraisal consisted of the statement on how much the participants experienced the emotional exhaustion after watching the video in each group. The participants' assessment on emotional regulation consisted of one item with answer options ranged from 1 (strongly disagree) to 5 (strongly agree). Assessment sample of emotional exhaustion was "During the movie; my energy was drained."

4) *Emotional Control scale*. The emotion control assessment consisted of the statement on how much the participants attempted to control their emotion after watching the video. The participants' assessment of emotion

control consisted of one item with answer option ranged from 1 (strongly disagree) to 5 (strongly agree). Statement sample of emotional was "While watching the movie; I tried to control my emotion."

5) *Heart Beat Rate*. The physiological measurement was used in heartbeat rate form. The measurement of heartbeat was conducted before and during the video playback. The result of the heartbeat rate was represented in beat per minute (bpm).

6) *Manipulation Check*. A manipulation check was given to ensure whether the instruction of emotional regulation strategy on each group has been appropriate. Manipulation check sheet consisted of three item questions. The statement sample was "While watching the movie; you tried an effort (choose): repress the feeling you had, switch the attention to another stuff or observe carefully.

D. Instrument

1) *Video*. The emotional regulation strategy was the independent variable in this study. The induction of disgusting emotion that wanted to be presented in this study using the burn and amputation video, the stimulation used in this study based on Gross' experiment [5]. In the previous study, this movie had been used by Paul Ekman at the University of California. Each group had three kinds of video; abstract, disgust and fun video.

2) *Laptop*. The experiment instruction and video offered to the participants was presented by a 14 inches laptop. There were 2 laptops used in this study, one for the participant while another one for recording the participants' heartbeat.

3) *Finger Pulse*. Finger pulse equipment offered to the participants to measure their heartbeat rate. The participants entered their fingertip into the finger pulse oximeter PO80 type. The finger pulse oximeter would record the average of the participants' heartbeat for one minute in beat per minute (bpm). The small screen in the finger pulse was covered by the white paper to avoid the participant's attention while watching the video.

E. Procedure

The participant entered to a 2 x 2 meters room and asked to sit down in a chair that has been provided; the participant was informed that this study related to their emotion and face and would be recorded. The participant was shown three short videos on the 14-inch laptop screen; all the instruction was played on the screen monitor. Before watching the video, the participant was asked to enter his/her fingertip on the finger pulse for one minute and asked to not do any other movement. Afterward, the participant was asked to fill the emotional condition scale.

After completing the emotional condition scale, the participant was informed that he/she would watch a blank video for one minute. The participant then was given the instruction "First of all, please clear your mind, feeling or other memories you had. Then, we will show you a short video, so it is important for you to watch this video carefully. However, if this video we show you is disturbing, just say STOP".

1) *Reappraisal Instruction.* "This time, if you have any other feeling while watching the video, let's observe the video you watch with certain ways, so when you watch the video, you will not have any other feeling. Watch it carefully, but try to think about what you see, so the video will not affect you at all".

2) *Suppression Instruction.* "This time, if you have certain feelings while watching the video, try to conceal those feelings you felt as possible as you can. In other words, when you watch the video, try so every person who looks at you will not realize that you feel something. Watch it carefully, but once again, please try to make everyone who sees your record will not realize you're feeling".

3) *Watch Instruction.* The watch group was not given any additional instruction as the reappraisal and suppression group had.

4) Then, the participant was shown a video, a disgusting movie while the participant enters his/her fingertip into the finger pulse. After watching the video, the participant completed back the emotional condition. The completion of emotional exhaustion and emotional regulation effort scale were given to the participants after they completed an emotional condition scale. At the end of the experiment process, the manipulation check sheet was done before the participants were shown the funny video.

F. Pilot Study

1) *Film Manipulation Test.* This test was given to five participants through the laptop screen; there were several movies played to the participants. The first movie was the movie that triggers the disgust emotion, like (a) fire victim treatment (b) hand amputation movie. The result of test analysis showed that the average of (a) image quality ($M=4.56$), (b) emotion ($M=3$), c impression ($M=2.6$)

Film Instruction Test. Film instruction was obtained from Gross' research [5] that has been translated to Indonesia. The three instructions were given to one of the Psychology lecturers to test understanding about the instruction. There are several instructions change to simplify the participants in order to understand the instruction, like the change of observing objectively, became observe in certain ways. Moreover, there was an additional explanation for reappraisal and suppression instruction. In order to simplify the participants during the disgusting movie, they were given the training video with similar instruction like reappraisal and suppression condition before.

2) *Questionnaire Tools Test.* This study used three questionnaires; emotional questionnaire, emotional exhaustion questionnaire, and emotional regulation questionnaire. These questionnaires were given to five subjects to be rated regarding its language use and instruction in order to result in the obvious questionnaires. From those five subjects, these questionnaires were proven that the language and items could be easily understood.

3) *Physiology Test.* In this study, physiology test measurement used a pulse oximeter, Beurer. It was the heartbeat measurement for participants before watching the movie and during the movie, which connected to the graph monitor. This physiology test was given to four subjects in order to measure the sensitivity and accuracy of the

heartbeat data in beat per minute (bpm). The result of physiology test showed that the test tool performed the accurate sensitivity level and can be used effectively.

III. RESULT

A. Descriptive Data

The participants in this study consisted of 35 subjects (42.7% were males). The number of participants that below 18 years old were 10 subjects (12.2%); 19-22 years old were 70 subjects (85.4%); and the rest were 23-25 years old. The participants came from several universities in Makassar. 11% of the total participants were in the I-II semester, 35.4% were in the III-IV semester, and 53.7% were in the V and up the semester. Participants of this study varied from several majorities; there were 34 participants (41.5%) from Psychology, 15 participants (18.3%) from Engineering, 10 participants (12.2%) from Economy and the rest came from other faculties.

B. Emotional Regulation Strategy on Happiness Emotion, Disgust and Fear.

The Opening Condition (Pre-Test). Based on the non-parametric Kruskal-Wallis Test analysis, showed that there was no distinction on happiness emotion, disgust and fear for each experimental group before the video show. There was no happiness emotion distinction between the groups, $H(2) = 0.442$, $p > 0.05$. On the happy emotion, the average suppression group ($M = 42.79$). There was no disgust emotion distinction among the groups, $H(2) = 2.412$, $p > 0.05$. On the disgusting emotion, the average suppression group ($M = 41.49$). There was no fear emotion distinction among the groups, $H(2) = 1.133$, $p > 0.05$. On the fear emotion, the average of suppression group ($M = 44.88$); reappraisal group ($M = 37.50$); and watch group ($M = 40.04$).

Emotional Condition after Movie Stimulus (Post Test). There was no happiness emotion distinction, $H(2) = 9.031$, $p < 0.05$; disgust $H(2) = 13.663$, $p < 0.05$ among the three experimental group after the video display. Meanwhile, on the happiness emotion, the average of suppression ($M = 43.78$); reappraisal group ($M = 21.30$); and watch group ($M = 44.68$). In addition, on the disgust emotion, the average of suppression group ($M = 42.77$); reappraisal ($M = 65.25$); and watch group ($M = 34.94$). On the fear emotion, the average of suppression group ($M = 43.40$); on the reappraisal ($M = 60.25$); and watch group ($M = 35.68$).

The Distinction of Emotion Regulation Strategy on the Emotional Exhaustion. The non-parametric Kruskal-Wallis Test analysis showed that there was emotional exhaustion difference among each of experimental groups. The result showed that generally, there was a significant difference in three groups due to the emotional exhaustion, $H(2) = 19.803$, $p < 0.05$. The average of emotional exhaustion which suggested by the suppression group ($M = 50.47$); reappraisal group ($M = 59.70$); and watch group ($M = 30.76$).

The Distinction of Emotion Regulation Strategy on the Emotional Control. There was emotional control difference on every experimental group. Generally, there was a significant difference among the three groups due to the emotional control, $H(2) = 19.334$, $p < 0.05$. The average of emotional control which suggested by the suppression group

($M = 52.32$); reappraisal group ($M = 55.05$); and watch group ($M = 30.55$).

C. The Distinction of Emotional Regulation Strategy on Heart Rate.

The Condition of Early Heart Rate (Pre-Test). There was no difference of heartbeat rate on each of the experimental group before the video display, $H(2) = 2.379$, $p > 0.05$. The result showed that generally, there was no significant difference in heartbeat rate among the three groups before the show. The average of early heartbeat rate from the suppression group ($M = 36.15$); reappraisal group ($M = 48.60$); and watch group ($M = 43.63$).

The Condition of Heart Rate after Movie Stimulus (Post Test). There was no difference of heartbeat rate on each of the experimental group after the video display, $H(2) = 3.573$, $p > 0.05$. The result showed that generally, there was no significant difference among the average heartbeat among the three groups after the movie stimulus. The average of heartbeat rate after the show from the suppression group ($M = 47.75$); reappraisal group ($M = 34.10$); and watch group ($M = 38.80$).

IV. DISCUSSION

This study offered different result from the previous study by Gross [5]. Suppression strategy for a long time has been regarded bring the disadvantages, evidently present happier emotion to the participants rather than reappraisal strategy. Although the reappraisal strategy presented the higher emotion control that suppression, it caused the bigger emotional exhaustion.

Generally, suppression strategy is performed to diminish or conceal the real emotion [10], while reappraisal strategy used to reprocess the current condition by changing the perspective about the meaning and impact from the emotion. The difference of the study result might be caused by cultural diversity from the participants in expressing the emotion. The participants in this study are the college students in Makassar, Indonesia. The attached culture is collectivist, differed from the previous study that performed the individualist culture. In a collectivist culture, the emotion expression must be similar to each other and follow the social norm. It depends on display rule [11]. In a collectivist culture, people tend to hide the negative emotion, so they prefer to suppression strategy. Another reason in this study found that individualist culture tends to avoid the negative emotion because it can threaten the group cohesivity [12]. Using the suppression strategy, the participants feel less emotional exhaustion and feel happier. Suppression strategy is more accepted and applied when facing the negative emotion.

The study conducted by Butler, Lee, and Gross [13] found that European female participants perform suppression strategy merely for protecting their self when encountering the negative emotion. In contrast, Asian females perform the suppression in their daily life. Thus, even the suppression strategy is regarded offering the disadvantages because the individual faces the discrepancy between what they feel and what they supposed to express, but the emotion expression still viewed properly in each society. Emotion expression should be matched with the social norm in surroundings.

V. CONCLUSION

There was no significant difference of emotional condition (happy, disgust and fear) on each experimental group that has been provided the video. When the participants were given the stimulus, like the negative movie, the group who performed the suppression strategy felt happier, while the group who used the reappraisal strategy felt more disgusted and the most fear group was the group who used reappraisal strategy.

From the average result of each group resulted that the participants who were given the negative film stimulus, so the group that felt the most emotional exhaustion was the participant used the reappraisal strategy.

When the participants were given the negative movie, the group that can control the emotion was the participant used the reappraisal strategy. This strategy enabled the participants to be influenced less by the disgusting video.

There was no difference of the heartbeat towards every experiment group, either before and after the video display. When the participants were given the negative movie stimulus, a group that had the highest heartbeat was the group that used the suppression strategy. However, this distinction was not found significantly either on reappraisal group nor watch group.

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