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RESEARCH ARTICLE

Relationship Between Procrastination and Stress Responses

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Abstract:

Introduction:

Procrastination is a maladaptive behavior that leads to failure of tasks, and a decrease in self-esteem and negative emotions; this behavior, however, becomes a habit. If procrastination becomes a habit, it will have a negative impact on your body and mind. Previous studies have divided participants by gender, age, *etc.*, and relationships between procrastination and stress have been examined. However, a general relationship between procrastination and stress has not been clarified. This study examined the relationship between procrastination and stress through a questionnaire survey.

Methods:

This study also examined the effects of passive or active procrastination on stress responses through a survey on active procrastination tendency. In addition, surveys were conducted on Japanese and Chinese people, and their answers were analyzed and compared between them. Hypotheses in this study are as follows: there are relationships between the participants' general procrastination tendency and stress responses (Hypothesis 1); participants with higher general procrastination tendency show higher stress responses than those with higher active procrastination tendency (Hypothesis 2). There are differences in relationships between procrastination tendencies and stress responses between Japanese and Chinese participants (Hypothesis 3). The results of the analysis have been discussed based on differences in cultural and social backgrounds.

Results:

These results showed a positive correlation between general procrastination and stress response in both Japanese and Chinese populations. Active procrastination was found to be positively correlated with stress response in Japanese and negatively correlated in Chinese.

Conclusion:

The results suggest that the relationship between procrastination and stress response is influenced by the subject's cultural background.

Keywords: Procrastination, Stress responses, Questionnaire, International comparison, Cultural background, Behavior.

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1. INTRODUCTION

A common phenomenon in our daily lives is procrastination. As Western scholars, Solomon & Rothblum (1984) [1], have noted, "procrastination is the act of unnecessarily delaying tasks that experience subjective anxiety or discomfort." Kohama (2014) [2] summarized various definitions of procrastination as follows: "Procrastination is a maladaptive behavior that leads to failure of tasks, and a decrease in self-esteem and negative emotions, and this behavior is a habit. It is thought that there are times when it will change." Fujita (2005) [3] explained that "Problem postponement behavior is strongly related to failure behavior." Procrastination is considered to be maladaptive behavior which will not only cause negative emotions but also lead to task failure. In addition, when procrastination behavior deteriorates, it has a negative effect on the mind and body. For example, low self-esteem may lead to self-denial and negative feelings may increase stress. According to Van Eerde (2003) [4], procrastination was positively associated with depression and anxiety. Hayashi (2007) [5] showed a positive correlation between procrastination characteristics, depression, and anxiety.

The depressed state is said to be caused by various

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stressors. Togasaki *et al*. (2005) [6] investigated the relationship between depression and stressors in students. As a result, it was revealed that students with high depression perceived the stressor significantly more strongly. In addition, Suzuki *et al*. (1997) [7] extracted "depression-anxiety" as one of the factors of a psychological stress response when they developed the Psychological Stress Response Scale (SRS-18). From this, it is inferred that the procrastination characteristics associated with depression and anxiety are also related to the degree of stress that individuals feel.

Previous studies have shown that there is a relationship between procrastination and depression, which is closely related to stress. Therefore, it is assumed that there is also a relationship between procrastination and stress.

Kuroyama (2010) [8] examined how stress coping should be related to the stress felt by college students, especially the effects of procrastination, according to gender. As a result, it became clear that procrastination had a great influence on all stress responses in males. On the other hand, it was found that the influence of susceptibility was greater than procrastination tendencies in females.

According to Chu & Choi (2005) [9], depending on whether the procrastinating behavior is intentional or unintentional, it can be divided into "Active Procrastination" and "Passive Procrastination". Those who proactively procrastinate have a habit of preferring stress, and proactive procrastination increases the efficiency of work and study. Passive procrastination is the act of procrastinating, either because of external influences or because of a lack of ability to manage time.

Takizawa (2010) [10] examined the correlation between positive procrastination and passive procrastination tendencies, procrastination behavior in actual tasks, and the state of emotions before and after the task. The conventional tendency to procrastinate correlated with stress both before and during the task, but the tendency to procrastinate only weakly correlated with stress just before the task started. Watanabe (2015) [11] showed that people with high optimism had low negative feelings before procrastination, and it was easy for them to switch moods after procrastination. Pessimism refers to negative feelings before procrastination and optimistic thoughts regarding the situation. He pointed out a positive correlation between planning and negative feelings during procrastination. Zheng (2018) [12] found that university students who regularly feel high tension in the context of a task often choose active procrastination, whereas university students who are out of control are passive and choose to delay.

Based on these previous studies, procrastination behavior can be divided into active behavior and passive behavior, and it is considered that the factors that lead to each behavior and the emotion caused by each behavior are different between these behaviors. When examining the relationship between stress and procrastination, it may be necessary to distinguish between the two types of procrastination.

In addition, since human environments can influence procrastination as an external factor, it is one of the factors that should be considered in the survey. For example, there may also be differences in characteristics of procrastination between college students living in different cultures and societies such as Japan and China. Therefore, it is important to make a comparison between the two countries.

Previous studies have divided participants by gender, age, *etc.* and examined relationships between procrastination and stress. However, a general relationship between procrastination and stress has not been clarified.

This study examined the relationship between procrastination and stress through a questionnaire survey. This study also examined the effects of passive or active procrastination on stress responses through a survey on active procrastination tendency. In addition, surveys were conducted on Japanese and Chinese people, and their answers were analyzed and compared . The results of the analysis were discussed based on differences in their cultural and social backgrounds. Hypotheses in this study are as follows.

Hypothesis 1: There are relationships between the participants' general procrastination tendency and stress responses.

Hypothesis 2: Participants with higher general procrastination tendency show higher stress responses than those with higher active procrastination tendency.

Hypothesis 3: There are differences in relationships between procrastination tendencies and stress responses between Japanese and Chinese participants.

2. METHODS

From September to October 2019, a questionnaire survey was conducted on 27 Chinese people. The same survey was also conducted on 60 Japanese from January to May 2020. These participants were young adults in their twenties, including college students. They were selected because academic procrastination behavior is a common problem for college students (Fujita & Noguchi, 2009) [13].

Three kinds of psychological scales were used for the surveys. The first scale, which was created by Hayashi (2007) [5], was the General Procrastination Scale Japanese version (GPS). The General Procrastination Scale (Lay, 1986) [14] is the psychological scale which is frequently used for the measurement of one's procrastination tendency. This study adopted the Japanese version of this scale (Hayashi, 2007) [5] for Japanese participants and translated it to Chinese for Chinese participants. The participants were asked to answer 13 questions using a five-point scale from "not applicable" to "applicable". One's score of procrastination tendency can be calculated by adding up their answers to all questions.

The second scale is the Active Procrastination Scale (APS) created by Choi & Moran (2009) [15]. APS is a scale of active procrastination tendency and asks participants to answer 16 questions using a seven-point scale from "1: Not very applicable" to "7: Very applicable". One's score of active procrastination tendency can be calculated by adding up their answers to all questions.

The third scale is the Psychological Stress Response Scale (SRS-18). The SRS-18 is a scale of stress responses which consists of three subscales (Depression-Anxiety, Irritability-Anger, and Helplessness) and 18 questions. This scale asks participants to answer each item using a four-point scale from

"0: Totally different" to "3: Exactly". Based on their answers, one's scores of each subscale and total scores are calculated.

The hypotheses of this study were verified by performing statistical analysis for the results of these questionnaires. First, correlation analysis was performed for the total scores of the GPS and APS, the scores of each subscale, and the total scores of SRS-18. Next, the correlation analysis was performed also for the results of surveys on Japanese and Chinese participants, and the results of the analysis were compared between them.

3. RESULTS

The results of the correlation analysis for all participants, Japanese participants, and Chinese participants are shown in Tables **1-3**. For all participants, the total score of GPS, the total score of SRS-18, and the scores of each subscale were all positively correlated ($p < .01$). There was also a positive correlation between total scores of APS and Helplessness, the subscale of SRS-18 ($p < .05$). As for the Japanese participants, the total score of GPS was positively correlated with the total score of SRS-18 ($p < .01$), the score of Depression-anxiety ($p < .05$), and the score of Helplessness ($p < .01$). There was also a positive correlation between the total score of APS, the total score of SRS-18 ($p < .05$), and the score of Helplessness ($p < .01$). As for the Chinese participants, the total score of GPS was positively correlated with the total score of SRS-18, the score of Depression-Anxiety, and the score of Helplessness ($p < .01$), The total score of APS was negatively correlated with the total score of SRS-18 ($p < .05$), the score of Depression-Anxiety ($p < .05$), and the score of Helplessness ($p < .01$).

Table 1. Results of correlation analysis for all participants.

-	Score of GPS	Score of APS
Depression-Anxiety	.426**	.075
Irritability-Anger	.296**	.060
Helplessness	.524**	.240*
Total score of SRS-18	.479**	.141
		*: $p < .05$, **: $p < .01$

Table 2. Results of correlation analysis for Japanese participants.

-	Score of GPS	Score of APS
Depression-Anxiety	.324*	.214
Irritability-Anger	.215	.102
Helplessness	.388**	.442**
Total score of SRS-18	.356**	.291*
		*: $p < .05$, **: $p < .01$

Table 3. Results of correlation analysis for Chinese participants.

-	Score of GPS	Score of APS
Depression-Anxiety	.543**	-.419*
Irritability-Anger	.351	-.265
Helplessness	.775**	-.503**
Total score of SRS-18	.671**	-.481*
		*: $p < .05$, **: $p < .01$

4. DISCUSSION

Correlation analysis showed a positive correlation between the scores of GPS and the subscales of SRS-18, which suggested the relationship between the general procrastination tendency and stress responses. However, as for the score of APS, there is only a correlation with the score of Helplessness. Compared to general procrastination tendency, there were no close relationships between active procrastination tendency and the stress responses. These results suggested the necessity of distinguishing procrastination tendencies in terms of active and passive aspects.

Furthermore, both the Japanese and Chinese participants' scores of GPS and the subscales of SRS-18 (Depression-Anxiety and Helplessness) were positively correlated. However, comparing the results of analysis for them, the correlation between the Chinese participants' scores was somewhat stronger than the Japanese participants' scores. As for the score of APS, the Japanese participants' scores showed a positive correlation with the score of Helplessness, while the Chinese participants' scores showed a negative correlation with the scores of Depression-Anxiety and Helplessness.

From the above, there are differences in the relationships between the procrastination tendencies and the stress responses between the Japanese and Chinese. In particular, the higher the Chinese active procrastination tendency is, the lower their stress responses are. Therefore, the relationships between procrastination and stress responses are considered to be very different depending on whether one's procrastination tendency is active or passive.

As described above, there was a relationship found between general procrastination and stress responses in both Japanese and Chinese. In contrast, a relationship between active procrastination and the stress response was different between Japanese and Chinese. The higher tendency of active procrastination Japanese participants had, the higher stress responses they showed. On the other hand, the higher tendency of active procrastination Chinese participants had, the lower the stress response they showed.

The reason for this difference can be attributed to differences in national characteristics between Japanese and Chinese. According to Li (2008) [16], there are differences in their attitudes toward human relations such that Chinese prioritize the self over the group while Japanese place the highest priority on the control of the group. Considering that, active procrastination which prioritizes self-pacing, planning and scheduling may be perceived by the Japanese as inappropriate behavior in social life. Therefore, the high tendency of active procrastination of Japanese might be positively correlated with the stress responses. Conversely, active procrastination can be regarded as a coping behavior through self-management for Chinese people who tend to prioritize oneself. This can be the reason why Chinese participants' score of APS is not negatively correlated only with the score of Helplessness but also the score of Depression-Anxiety.

CONCLUSION

The results of the questionnaires for the Japanese and Chinese university students revealed the relationship between

the tendency of general procrastination and the stress responses. The previous studies (Van Eerde, 2003; Hayashi, 2007) [4, 5] had shown the relationship between depression, anxiety and procrastination tendencies, and the results of this study are consistent with these reports.

Comparing the results of the surveys for Japanese and Chinese, there was a significant difference found in the relationship between active procrastination and stress responses. This suggests that it is important to distinguish between passive and active procrastination. The results of this study are expected to contribute to mental health care as well as learning support for students. There is one aspect of international discovery, such that there are significant differences between Asian groups and relative responses in the psychological field. It is also possible that differences in the sociocultural backgrounds of the participants may have influenced these results, and further surveys should be conducted with a wider range of participants than just Japanese and Chinese.

This study did not investigate contexts, circumstances, and causes of procrastination. Relationships between procrastination and stress responses are considered to vary depending on the circumstances and causes of procrastination. For this reason, it is necessary to focus on these factors in future research.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Our study was not approved by an ethics committee because its invasiveness was low but the questionnaire was conducted with ethical considerations for the participants.

CONSENT FOR PUBLICATION

Informed consent was taken from all the participants when they were enrolled.

AVAILABILITY OF DATA AND MATERIALS

The data that support the findings of this study is available within the article.

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None.

CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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