

# Features of Developmental Level of Defense Mechanisms and Adjustment Status of University Students in Japan

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## Abstract

A person with high-level mental defensive functioning exhibits optimal, effective adaptive states when encountering stressors. This may be an important factor in maintaining a sound campus life. Participants were 47 physically and mentally healthy students (average age  $19.0 \pm 0.6$ ). We first investigated the developmental level of mental defensive functioning as an indicator of participants' adaptive state at the time of the study. We used the Defensive Functioning Scale proposed in the 4<sup>th</sup> edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). We attempted to quantify this scale by summing scores of seven Defense Levels based on individual defense mechanisms. We then measured physical and mental symptoms using the Cornell Medical Index (CMI), and compared the relationships between symptoms and defensive functioning (defensive functioning scale and physical symptoms, defensive functioning scale and mental symptoms, and physical symptoms and mental symptoms). Finally, we compared male and female results. Although there was no statistical difference, males showed higher average scores than females on the Defensive Functioning Scale vs physical/mental symptoms, which may indicate the relative suppression of women that characterizes the social and cultural background in Japan. In addition, there was a relatively high unisex positive correlation between physical symptoms and mental symptoms, which suggests that university health administrative staff need to provide mental as well as physical care to help students manage stress effectively. However, larger, more comparative studies on the social and cultural background are needed to further explore these issues.

## Keywords

Defense Levels and Defensive Functioning, Physical Symptoms, Mental Symptoms, Adaptive

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## State, Stress

### 1. Introduction

The increase in mental disorders, particularly following economic crises [1], is a problem in many developed countries. Traditional psychological theory suggests that a person with high-level mental defensive functioning would exhibit an optimal, effective adaptive state when encountering a stressor [2]. This may be an important factor in maintaining a sound student campus life.

We investigated the developmental level of mental defensive functioning as an indicator of participants' adaptive state at the time of the study. We used the Defensive Functioning Scale proposed in "Appendix B" described in the 4<sup>th</sup> edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). We attempted to quantify this scale by summing the scores of seven Defense Levels based on individual defense mechanisms. We then examined physical and mental symptoms using the Cornell Medical Index (CMI), and compared relationships between symptoms and defensive functioning. Finally, we compared male and female results.

Our investigation revealed a sex difference in stress management and a unisex positive correlation between physical symptoms and mental symptoms. These findings may contribute to helping university students manage stress effectively.

### 2. Methods

#### 2.1. Subjects

Participants were 47 physically and mentally healthy students. Their profile is shown in **Table 1**. Participants had attended a class in acquiring proficiency in defensive functioning level. Written informed consent was obtained from all subjects and the study was approved by the institutional review board of Niigata University.

#### 2.2. Instruments

*Defensive Functioning Scale.* We used the Defensive Functioning Scale, described in "Appendix B of Criteria sets and axes provided for further study of DSM-IV" to measure participants' level of defensive functioning [3] (**Table 2**). The scale requires participants to list up to seven defense mechanisms starting with the most prominent; each defense mechanism is grouped under seven Defense Levels (see **Table 2**). Each participants' scores on the seven Defense Levels were summed from a possible total of 840 points as follows: High adaptive level (30 points), Mental inhibitions level (25 points), Minor image-distorting level (20 points), Disavowal level (15 points), Major image-distorting level (10 points), Action level (5 points), and Level of defensive dysregulation (0 points). This method of quantification is our original because it is invented by our team.

*Cornell Medical Index (CMI).* The CMI was developed in the US and is used worldwide for diagnosis and patient care at the bedside [4]-[8]. With the addition of some local questions, this test has been widely used for more than half a century in Japan. It was devised to meet the need to collect a large body of pertinent medical and psychiatric data with minimal time expenditure. It consists of two categories: physical symptoms (including past illness and family history) and mental symptoms (behavior, mood, or feeling). There are 12 sections measuring physical symptoms (A-L) and 6 sections measuring mental symptoms (M-R) as shown in **Table 3**.

#### 2.3. Analysis of Adaptive State

The relationships between defensive functioning and physical symptoms, defensive functioning and mental

**Table 1.** Profile of participants.

Subjects	Male	Female	Total
Number (%)	28 (59.6)	19 (40.4)	47 (100.0)
Average age	19.2 ± 0.6	18.7 ± 0.7	19.0 ± 0.6

**Table 2.** Defensive functioning scale defense levels and defense mechanisms (“Appendix B” described in DSM-IV).

Defense levels	Individual defense mechanisms	Score
1. High adaptive level	Anticipation, affiliation, altruism, humor, self-assertion, self-observation, sublimation, suppression	30
2. Mental inhibition level	Displacement, dissociation, intellectualization, isolation of affect, reaction formation, repression, undoing	25
3. Minor image-distorting level	Devaluation, idealization, omnipotence	20
4. Disavowal level	Denial, projection, rationalization	15
5. Major image-distorting level	Autistic fantasy, projective identification, splitting of self-image or image of others	10
6. Action level	Acting out, apathetic withdrawal, help-rejecting complaining, passive aggression	5
7. Level of defensive dysregulation	Delusional projection, psychotic denial, psychotic distortion	0

**Table 3.** Cornell Medical Index (CMI).

Section	Questions reflecting to	Male	Female
<b>Physical symptoms</b>			
A	Eyes and ears	10	10
B	Respiratory system	21	21
C	Cardiovascular system	14	14
D	Digestive tract	28	28
E	Musculoskeletal system	10	10
F	Skin	9	9
G	Nervous system	19	19
H	Genitourinary system	11	13
I	Fatigability	7	7
J	Frequency of illness	9	9
K	Miscellaneous disease	15	15
L	Habits	7	7
<b>Total</b>		<b>160</b>	<b>162</b>
<b>Mental symptoms</b>			
M	Mood and feeling patterns	12	12
N	Inadequacy	6	6
O	Depression	9	9
P	Anxiety	6	6
Q	Sensitivity	9	9
R	Anger	9	9
<b>Total</b>		<b>51</b>	<b>51</b>

symptoms, and physical symptoms and mental symptoms were examined to investigate the developmental level of defensive functioning and adaptive state. Regression analyses were conducted using statistical software Statcel 2 (OMS Publishing, Saitama, Japan), which is written in Visual Basic for Applications. The Mann-Whitney

U test was performed using IBM SPSS Statistics for Windows version 20.0 (Armonk, NY: IBM Corp.). Means ( $\pm$ standard deviations) were calculated to compare male and female groups. All statistical tests were two-tailed and statistical significance was defined as  $P < 0.05$ .

### 3. Results

#### 3.1. Average Scores for Defensive Functioning, Physical Symptoms, and Mental Symptoms

Means and standard deviations for scores on the defensive functioning scale, physical symptoms, and mental symptoms are shown in **Table 4**.

#### 3.2. Relationship between Defensive Functioning and Physical and Mental Symptoms

The relationships between defensive functioning and physical symptoms, and between defensive functioning and mental symptoms, were examined. Males scored higher than females on defensive functioning and physical symptoms, although the differences were not statistically significant ( $P = 0.91$ ,  $P = 0.51$ , respectively). This may be because of the considerable individual variability in these scores.

For males, there was a positive correlation between defensive functioning and physical symptoms, and between defensive functioning and mental symptoms; however, these relationships were negative for females (**Figure 1(a)**, **Figure 1(b)**). There was also a notable difference in the average of physical symptoms scores. Females scored higher than males by 2 points on section H of the CMI (genitourinary system). However, the overall average CMI score for males was higher than that of females ( $15.5 \pm 7.8$  compared to  $14.8 \pm 6.1$ ).

#### 3.3. Relationship between Physical Symptoms and Mental Symptoms: Maintaining the Integrity of the Specifications

Correlations between physical symptoms and mental symptoms were positive and relatively high for both males and females ( $r [R^2]$ : 0.74 [0.5485] and 0.77 [0.5969]) (**Figure 1(c)**).

## 4. Discussion

### 4.1. Defense Mechanisms

Defense mechanisms are automatic psychological processes that protect the individual against anxiety and from the awareness of internal or external dangers or stressors. Individuals are often unaware of these processes as they operate. Defense mechanisms mediate the individual's reaction to emotional conflicts and to internal and external stressors. Individual defense mechanisms are divided conceptually and empirically into related groups that are referred to as Defense Levels [3].

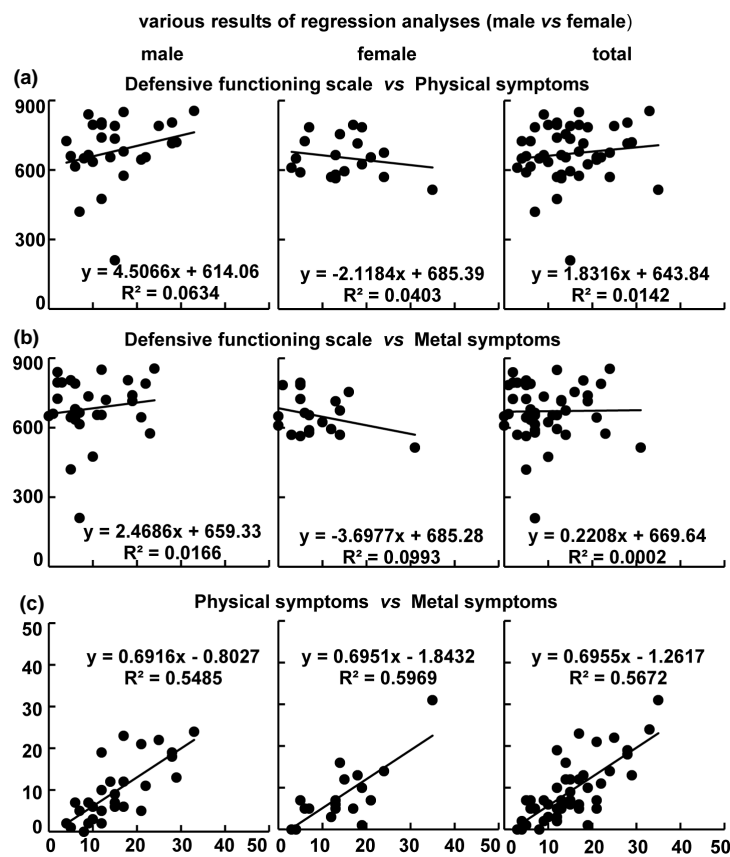
The results of this study showed that participants' developmental level of mental defensive functioning was quite sound (males  $[683.8 \pm 140.3]/810$ , females  $[653.9 \pm 85.3]/810$ ). This suggests that the personality structure has almost completely developed by 18 - 20 years old.

### 4.2. Male and Female Differences

Although the differences were not statistically significant, it was of interest that males' average scores on the Defensive Functioning Scale, physical symptoms and mental symptoms were higher than females'. This may be a result of the social and cultural background in Japan, which has led to the suppression of women's social status. For modern Japanese women, physical and mental patience is considered a virtue [9].

**Table 4.** Comparison between males and females (Means and SDs).

Scores	Male	Female	P value
Defensive functioning scale	$683.8 \pm 140.3$	$653.9 \pm 85.3$	0.91
Physical symptoms score	$15.5 \pm 7.8$	$14.8 \pm 8.1$	0.51
Mental symptoms score	$9.9 \pm 7.3$	$8.5 \pm 7.3$	0.09



**Figure 1.** Various results of regression analyses were conducted (male vs female). The left panel, the middle and the right panel showed all subjects, male and female respectively. (a) Defensive functioning scale and Physical symptoms; (b) Defensive functioning scale and Mental symptoms; (c) Physical symptoms and Mental symptoms.

A pertinent example is the ratio of female administrative service workers above the level of division chief in Japan. This is a mere 11.1%, whereas the same figures in America and France are 43.1% and 39.4%, respectively [10]. Even in modern times, young females may be unduly influenced by this traditional attitude and may consciously—or unconsciously—suppress their thoughts and feelings even when experiencing physical or mental stress.

### 4.3. Relationship between Physical and Mental Symptoms

For both males and females, there was a relatively high correlation between physical symptoms and mental symptoms; this psychosomatic correlation suggests an adaptive response. Therefore, university health administrative staff need to provide both physical and mental care to help students manage stress effectively. However, larger, comparative studies exploring the social and cultural background of other countries are needed to add support to these conclusions.

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