

A Study of Depression Factors in Taiwanese Students of Department of Design

Eva Chang¹, Rain Chen^{2*}

¹ Independent Designer, Tainan, TAIWAN

² Department of Visual Communication Design, Southern Taiwan University of Science and Technology, Tainan, TAIWAN

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ABSTRACT

Since Taiwan government has aggressively promoted its national capacity of innovative design in recent years, the need for designers with professional knowledge and skills has been increased significantly, and many colleges have established Department of Design accordingly. However, it was found that the fluctuation of mood of students from Department of Design is more significant than that from other Departments. The change in mood influences students' recognition of shapes and colors. This study applied CES-D (Center for Epidemiological Studies Depression) scale to test the current mood status of 120 freshmen from Department of Design and further find out the depression factors. From the factors of the study, six of them have been independent. These factors include "negative affect", "interpersonal problem", "physical and mental fatigue", "sadness and crying", "sleep disorder", and "inappetence". In fact, students from Department of Design appear to have Atypical Depression physically. They conceal the melancholic symptoms so that other people can hardly be aware of their depression. The study results can be the reference for current teachers of design education.

Keywords: depression factors, color, department of design, design education

INTRODUCTION

Industrial Development Bureau of Ministry of Economic Affairs has promoted "The Comprehensive Promotion Plan for Product Design Capacity" since 1989, for which it has helped the rapid growth of industrial design industry in Taiwan. In 2002, the Bureau selected design industry as one of ten sunrise industries with good development potential. Hence, design industry has become indispensable to Taiwan moving forward to high value-added center. The rise of design industry stimulates not only the need for designers but also the increasing establishment of Design Departments annually (Executive Yuan of Taiwan, 2017).

According to an investigation of the John Tung Foundation in 2005, one in four college students have severe depression and need professional help (Luo, 2005). Besides, students from School of Art, School of Design, and School of livelihood related are more depressed than that from School of Science, Engineering, Agriculture, Medicine, Nursing, and Education. In Taiwan, for college related to Art, Design, and livelihood, the Government gives development priority to the Departments related to Design. It was found that whether people are depressed does have an influence on their principle of facial coloring, for which it means when students of Department of Design match colors for products, they are influenced by their moods. When their moods are stable, their choices of color matching are stable. On the other hand, when students of Department of Design are moody, their choices of color matching are also affected (Wu et al., 2009). The study results showed that the change of mood affects the recognition of shapes and colors of students of Department of Design. When the levels of depression of students are higher, the instability of their responses to questions is also higher. A research of Gregorian et al. stated that painting creations of children who were suffering from posttraumatic stress disorder after they experienced an earthquake changed with time. In the first session of therapy, it was found that those children chose black, red, and white in the beginning (Gregorian et al., 1996).

Contribution of this paper to the literature

- To understand the depression of students from Department of Design, and discover the primary depression factors.
- Approximately one-third of the subjects had depressive tendencies.
- This study obtained the structures of six factors from the students of Department of Design. It is different from other studies. In addition to “depressed affect” and “interpersonal problem”, four more factors, including “physical and mental fatigue”, “sadness and crying”, “sleep disorder”, and “inappetence” have been found.

The advancement of the times has seen an increase in the number of people with depression, and the age of first occurrence is observed lower gradually. There is a rapid increase of youths with depression (Lewinsohn et al., 1993). Studies show that there is a significant correlation between youth depression and later suicidal intent (Beautrais, 2000; Groholt et al., 2000; Shaffer & Piacentini, 1994; O'Carroll et al., 1994; Committee on Adolescence, 1996; Committee on Adolescence 2000). Many epidemiological studies on children and adolescents consistently point out that depression is rarely found before age 13 but the cumulative incidence greatly increases after age 13. The peak is found between age 15 and 18 (Burke et al., 1990; Hankin et al., 1998). Studies show that there is a significant correlation between youth depression and later suicidal intent (Cole, 1993). For patients with depression, the youth have higher death rates (Birmaher et al., 1996). Depression is associated with multiple impairments in functioning, particularly in the social and academic domains (Kovacs & Goldston, 1991; Puig-Antich et al., 1993).

As the number of adolescent patients with depression is increasing, many studies have attempted to discover the suitability of instruments for measuring the mood states of adolescents. The swinging mood of adolescent also affects the measuring of the level of depression. Take CES-D as an example, a score of 16 or greater is generally considered the best critical point to identify if an adult is at risk of clinical depression. Nevertheless, many research results found that the score of the best critical point varies with different cultures and age groups. Some researches pointed out that the score of the best critical point to distinguish depression in adolescents has to be greater because of their swinging mood (Doerfler et al., 1988; Garrison et al., 1991). For the junior high school students in Taiwan, a score of 0-28 indicates no depression, a score of 29-48 indicates moderate depression, and a score of 49-60 indicates severe depression (Yang et al., 2004).

Many studies applied principal components analysis or factor analysis to verify the validity of CES-D among children or adolescents, and the results were found to be quite effective (Edman et al., 1999; Faulstich et al., 1986; Makini et al., 1996; Olsson & von Knorring, 1997). Symptoms of depression in adolescents are different from those in adults. Moreover, different cultures have different factors of depression. The existing depression factors are affected and varied by cross-culture. Radloff (1977) obtained a structure of four factors from American samples: “depressed affect,” “positive affect,” “somatic and retarded activity,” and “interpersonal problem”. His research results were affirmed by other studies (Grayson et al., 2000; Miller et al., 1997). Besides, since question number 4, 8, 12, and 16 in the 20-question CES-D questionnaire are asked in a positive tone, the results of many studies have turned out to be a bi-factor structure with one positive factor and one negative factor. The results of a study conducted by Miller et al. of elderly Mexican Americans (Miller et al., 1997) and the results of a study conducted by Edman et al. of 243 Filipino-Americans living in Hawaii (Edman et al., 1999) are both in a bi-factor structure with one positive and one negative.

Different studies have also shown two to seven-factor structure (Boisvert et al., 2003). Spijker et al. (2004) studied three ethnic groups, including Moroccan, Turk, and Dutch with an exploratory comparison by applying the CES-D scale factor structure. The factor analysis showed a structure of three, four, and five factors respectively. Two factors, “positive affect” and “interpersonal problem”, were stably independent from the three ethnic samples (Spijker et al., 2004). Ying (1988) studied 360 Asian Americans by applying the CES-D for factor analysis, and the results were a three-factor structure: “depressed affect,” “positive affect,” and “interpersonal problem” (Ying., 1988). Besides, there was study of 138 married couples in Hong Kong as research subjects by Cheung & Bagley (1998). By applying CES-D scale, the result showed that the two-factor structure of “depressive symptoms” and “interpersonal problem” has high goodness of fit (Cheung & Bagley., 1998).

In summary, depression factors obtained by the CES-D scale vary from cross-culture. Furthermore, two factors, including “depressed affect” and “interpersonal problem”, can be stably isolated from most of the ethnic samples. Therefore, the primary research objective of this study is to explore the depression status of students from Department of Design and discover the primary depression factors.

METHODS

Subjects

Since the depression rate of females is higher than males, most of the selected subjects were females. Patients suffer from depressive symptoms only in autumn, winter, and spring are called Seasonal Affective Disorder, SAD. SAD are often caused by insufficient sunlight (Benedetti et al., 2003). In order to avoid disrupting the target of the research, the volunteer subjects participating in this study were 120 freshman of Department of Design from Southern Taiwan, including Shu-Te University, Kun Shan University, Southern Taiwan University, and Chang Jung Christian University. There were 120 freshmen of Department of Design participating in answering the CES-D. There were 76 females and 44 males, and the average age of the subjects was 18.6 (ranging from 18-24).

Measures

This study employed the Center for Epidemiologic Studies-Depression Scale (CES-D) issued by Radloff to measure the symptoms of depression and determine the seriousness. The CES-D was designed to measure adult depression symptoms. In recent years, it was found that it also has good reliability and validity applying to children and adolescents (Li et al., 2001; Makini et al., 1996; Olsson et al., 1999; Prescott et al., 1998; Edman et al., 1999; Olsson & von Knorring, 1997). The CES-D questionnaire applied in this study was translated by Dr. Chien who has achieved decent validity and reliability from studies of adult samples in Taiwanese communities (Chien & Cheng, 1985).

This questionnaire includes 20 questions about the level of symptoms experienced by the subjects over the past week. The scores range from 0 to 3 points: rare or never (under 1 day) is 0 points, a few or seldom (1~2 days) is 1 point, often or most of the time (3~4 days) is 2 points, mostly or almost all the time (5~7 days) is 3 points. The questions 4, 8, 12, and 16 were control for response bias, so the scores were counted in reverse. The CES-D score ranges from 0 to 60, wherein a higher score indicates the higher frequency and number of symptoms related to depression. The CES-D was designed to measure adult depression symptoms. In recent years, it was found that it also has a good reliability and validity applying to children and adolescents (Edman et al., 1999; Li et al., 2001; Makini et al., 1996; Olsson et al., 1999; Prescott et al., 1998; Olsson & von Knorring, 1997).

Procedures

The study began by placing each subject in a quiet room. After the experimenter provided the instructions for answering the CES-D, the questionnaires were filled out by the subjects.

RESULTS

Depression in Freshmen of Department of Design

The CES-D is applied to measure the levels of depression in freshman of Department of Design. A higher total score indicates more severe depression. The test results: mean score was 24.8 points, the highest score was 49 points, and the lowest score was 4 points. Generally, a score of 16 on CES-D is considered to indicate depression in adults. However, due to cultural differences and the swinging mood of youths (Garrison et al., 1991), Yang et al. proposed that 29 points should be regarded as the critical point in determining whether Taiwanese youths are depressed (Yang et al., 2004). Therefore, this study divided the subjects into two groups: Depressive Tendency (DT) and No Depressive Tendency (NoDT), applying the critical point of 29 on the CES-D. The result showed that 82 subjects were NoDT (68% of the total) and 38 subjects were DT (31% of the total). If the score of 29 points was assumed as the best critical point, according to the test results, 82 subjects were NoDT (68% of the total) and 38 subjects were DT (31% of the total). It is observed from the results that approximately one-third of the test subjects have depressive tendencies. Thus it agrees with the results of the study conducted by Yeh (2005).

This study examined the internal consistency of reliability of the CES-D Scale, and the Cronbach's alpha was 0.90. It means that the survey results showed a high degree of reliability. **Table 1** shows the mean score and standard deviation of the 20-question CES-D questionnaire. In the 20 questions, responses to question 20 "I could not get going" got the highest mean scores is 1.86, and responses to question 17 "I had crying spells" got the lowest mean scores is 0.39.

Table 1. The mean score and standard deviation of the 20-question CES-D questionnaire

Items	Mean	Std.
1 I was bothered by things that usually don't bother me	1.63	1.07
2 I did not feel like eating; my appetite was poor	0.47	0.69
3 I felt that I could not shake off the blues even with help from my family	1.36	1.16
4 I felt that I was just as good as other people	1.49	1.04
5 I had trouble keeping my mind on what I was doing	1.61	0.93
6 I felt depressed	1.49	0.99
7 I felt that everything I did was an effort	1.38	0.98
8 I felt hopeful about the future	1.52	1.04
9 I thought my life had been a failure	0.87	0.90
10 I felt fearful	1.25	1.07
11 My sleep was restless	0.86	1.01
12 I was happy	1.24	0.98
13 I talked less than usual	1.17	0.90
14 I felt lonely	1.42	1.10
15 People were unfriendly	1.03	1.01
16 I enjoyed life	1.30	0.92
17 I had crying spells	0.39	0.70
18 I felt sad	1.25	1.02
19 I felt that people disliked me	1.26	1.04
20 I could not get going	1.86	1.01

Items are listed in presented order, N = 120

Results of Factor Analysis

The study applied the 20-question CES-D Scale to conduct the factor analysis in order to discover factors associated to depression in freshmen of Department of Design. Firstly, KMO measure of sampling adequacy and the Bartlett's sphericity test were applied to ascertain whether CES-D questionnaire would be suitable for factor analysis. With the KMO value 0.83, the Bartlett's sphericity test value 1129.1, and significance 0.0, it is confirmed that the data is suitable for factor analysis. Next, principal component analysis was applied and eigenvalue was set to be more than 1 to obtain factors, and slope diagram was also applied to examine the suitability of factor digits. The Varimax was applied to perform orthogonal rotations. Finally, 6 factors were obtained, and they can explain approximately 70% of the variance ratio, with factor loading value of 20 variables over 0.5. This study named these six factors: "negative affect," "interpersonal problem," "physical and mental fatigue," "sadness and crying," "sleep disorder," and "inappetence," as shown in [Table 2](#).

From [Table 2](#), it can be deduced that there were six variables loadings on "negative affect" (Factor 1), seven variables loadings on "interpersonal problem" (Factor 2), four variables loadings on "physical and mental fatigue" (Factor 3), and only one variable loading on "sadness and crying" (Factor 4), "sleep disorder" (Factor 5), and "inappetence" (Factor 6). According to the past studies of depression factors, it is observed that "negative affect" (Factor 1) and "interpersonal problem" (Factor 2) were commonly found in most of the studies. However, there were four other factors found in the samples of this study: "physical and mental fatigue," "sadness and crying," "sleep disorder," and "inappetence." The highest loadings on Factor 1 were questions 1-4, which were asked in a positive tone; the highest loading on Factor 2 was question 13 "I talked less than usual"; the highest loading on Factor 3 was question 5 "I had trouble keeping my mind on what I was doing". Different from other results, there were only one variable for the three factors: loading on Factor 4 was question 17 "I had crying spells," loading on Factor 5 was question 11 "My sleep was restless," and on Factor 6 was question 2 "I did not feel like eating; my appetite was poor."

Table 2. Results of CES-D questionnaire with factor analysis regarding freshman of Department of Design

Items	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
8 I felt hopeful about the future	0.76					
16 I enjoyed life	0.75					
4 I felt that I was just as good ...	0.69					
12 I was happy	0.64					
9 I thought my life had...	0.64					
3 I felt that I could not shake off ...	0.53					
13 I talked less than usual		0.77				
15 People were unfriendly		0.66				
14 I felt lonely		0.63				
6 I felt depressed		0.62				
18 I felt sad		0.58				
19 I felt that people disliked me		0.57				
1 I was bothered by things that ...		0.55				
5 I had trouble keeping my mind...			0.81			
7 I felt that everything I did was...			0.69			
20 I could not get going			0.58			
10 I felt fearful			0.58			
17 I had crying spells				0.81		
11 My sleep was restless					0.87	
2 I did not feel like eating...						0.78
Eigenvalue	3.92	3.51	2.33	1.50	1.43	1.24
% of Variance	19.61	17.55	11.63	7.46	7.13	6.19
Cumulative %	19.61	37.16	48.78	56.27	63.36	69.55

Criteria: Eigenvalue > 1, Enter limit: Coefficient > 0.50. When the coordinates are "rotated varimax", the factors do not correlate.

SUMMARY

For the factors obtained in this study, six factors can be independent explicitly. What make it different from other studies is that, in addition to "negative affect" and "interpersonal problem", there are four more factors: "physical and mental fatigue," "sadness and crying," "sleep disorder," and "inappetence." According to the past studies of depression factors, it was found that negative affect and interpersonal problem can be stably independent from samples of different subjects. The result of factor analysis in this study showed that the most important factors were "negative affect" and "interpersonal problem" (with the highest eigenvalue). However, the factors "sadness and crying," "sleep disorder," and "inappetence" were different from other factors and were stably independent with only one variable.

Freshmen have to get with the lifestyle of university as well as the increasing academic pressure. In addition to the loading of general courses, the students of Department of Design have to complete various design works. Factor analysis of the reason for depression of freshmen of Department of Design found that in addition to "negative affect", "interpersonal problem" was another important factor. This may be because freshmen of university are not yet familiar with their classmates.

According to the studies of depressed children and adolescents, atypical features of depression occur in this age group (Lewinsohn et al., 1994; Williamson et al., 2000). Two manifestations of depression are major depressive disorder and atypical depression. Symptoms of major depressive disorder include unhappiness, lack of confidence, sleep disturbances, feelings of tearfulness, silence, having no intention of going out, inappetence, giddiness, chest tightness, upset stomach, and suicidal thoughts. In contrast, atypical depression was defined as the presence of mood reactivity during the depressive episode, along with at least one of four associated features: hypersomnia, hyperphagia, leaden paralysis, and rejection sensitivity. People with atypical depression can smile and tend to overeat, oversleep, and easily get moody due to mental stress (Brent & Birmaher, 2002; Kaminski et al., 2008; Stewart et al., 1993; Williamson et al., 2000). The most common type of depression found in adolescents is atypical depression. On the other hand, the type of depression most commonly affect adults is major depressive disorder.

Masked depression is a special type of atypical depression that may keep depressive tendencies from being observed by teachers and parents, and it makes diagnosis and treatment difficult. (Miodek et al., 2007). In addition, adolescents do not find it easy to elaborate their emotions (Marvin, 1990). Three factors were found in this study: "sadness and crying," "sleep disorder," and "inappetence" can explain the difference of influence between atypical depression in students of Department of Design and major depressive disorder in adults. Although students of Department of Design didn't get high scores on question 17 "I had crying spells" (Factor 4), question 11 "My sleep

was restless" (Factor 5), and question 2 "I did not feel like eating; my appetite was poor" (Factor 6), it remains uncertain that whether they were affected by atypical depression. "Interpersonal problem" as well as emotional pretense and closure may keep students with depressive tendencies from being observed by teachers and parents.

It is very important to understand the formation of depression and its pathological mechanisms in order to effectively preventing depression. Freshmen have to get with the lifestyle of university as well as the increasing academic pressure. In addition to the loading of general courses, the students of Department of Design have to complete various design works. Factor analysis of the reason for depression freshmen of Department of Design found that, in addition to "negative affect" and "interpersonal problems", the four factors, including "physical and mental fatigue", "sadness and crying", "sleep problem" and "inappetence" were important factors. Schools and educational authorities should be aware of this point to deal with issues related to those with the depressive tendency, and take preventative measures or seek for coping-strategies.

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