行政院國家科學委員會補助

大專學生研究計畫研究成果報告

```
＊ ******** ***************************************** ＊
＊  計 畫                                              ＊
＊        ：  跨區域研究—肥胖刻板印象對高中女生在助人行為上  ＊
＊  名 稱     的影響                                     ＊
＊ ******** ***************************************** ＊
```

跨區域研究—肥胖刻板印象對高中女生在助人行為上的影響

中文摘要

　　肥胖，是現在盛行的健康問題之一。而肥胖者除承擔生理上的風險外，亦受到社會上刻板印象的威脅。隨著時代的遷移，肥胖刻板印象（obesity-related stereotypes）議題越來越受到重視，諸如懶惰、朋友少、不愛運動、愛吃⋯等。又因刻板印象會影響行為及經驗,故本研究欲探討台灣與澳門地區的肥胖刻板印象，以及在助人行為上的差異。本研究以台灣與澳門地區的高中女生為研究對象，並於前置研究中選取適當的研究材料做為後續實驗材料之用，結果發現以往用於體型相關研究的圖像量尺在華人地區並沒有得到顯著的認同。另在實驗一先測量肥胖刻板印象的影響，其中，以圖像呈現來取代文字的描述，以降低受試者間的認知差異，其後經項目分析、因素分析、內部一致性分析刪除 3 題並獲得三項因素：「不良個人表現」（6 題）、「人際知覺」（4 題）和「生活型態」（3 題）；而其量表結果中肥胖刻板印象呈現顯著的主要效果。在實驗二中則探討刻板印象與助人行為間的關係，採用 3（實驗情境：刻板印象威脅組 vs. 控制組 vs.不提供體型訊息組）× 2（跨區域：台灣樣本 vs.澳門樣本），以幫助特定的目標個案之意願為依變項，經雙因子變異數分析結果發現，在助人意向一題目中呈現顯著的地區差異（$F_{(1,237)}=19.25, p<.05$），其中台灣樣本之助人意願（M=5.85）顯著高於澳門樣本之助人意願（M=5.14）。詳細內容與討論於正式報告。

關鍵字：肥胖刻板印象、圖像呈現、助人行為、跨區域研究

Cross-area Study—The Influence of Obesity Stereotypes on Helping Behavior in High School Girls

ABSTRACT

Obesity is a problem of health. However, health problem is not the only product but also a society problem with who gets obese. The obesity-related stereotypes become more important issue nowadays, which gets the idea that the person is lazy, sporting less, greedy etc. Behaviors and experiences could be influenced due to obesity-related stereotypes, which is the reason why setting up this research and try looking for the relationship between obesity stereotype and helping behavior. High school girls of Taiwan and Macau were the target samples in this research. For finding out suitable body image scale for experiments using, three different body image scales were using in the pilot study. In addition, the result showed that the Stunckard figure scale used in the past maybe was not suitable enough for using nowadays. In the experiment 1, effect of the obesity-related stereotypes was being tested, for lowering the differences between participants' meaning of "obesity", images were chosen to show up instead of using words when describing obesity. After item analysis, factor analysis and internal consistency analysis, 3 items were deleted and three factors were conducted: "Unwell Personal Performance" (6items), "Poor Interpersonal Perception" (4items) and "Inappropriate Life Style" (3items). Moreover, significant differences of obesity-related stereotype also presented in Experiment 1. Otherwise, the Experiment 2 used to operate the stereotype and tried to find out whether it affected on helping behavior, which conducted a 3(threat vs. control vs. no information supplied conditions)x2(Taiwan sample vs. Macau sample)design and used the willingness of helping others as dependent variables. After using two-way ANOVAs analyzed, significant difference of willingness to help target person between Taiwan (M=5.85) and Macau (M=5.14) was found, $(F_{(1,237)}=19.25, p<.05)$. After all, more details and findings of obesity-related stereotype are discussed.

Keywords: obesity-related stereotype, image showing, helping behavior, cross-area study

INTRODUCTION

Food is easier to get these days, and people always obtain over than needs and leading the society to be obese. In recent years, the problem of being obese is getting younger. In "Nutrition and Health Survey in Taiwan(NAHSIT)"(2005-2008) carried out from Department of Health ,Executive Yuan, R.O.C (TAIWAN), found that overweight ratio in male is growing from 33.4% to 50.8%, which in female from 31.7% to 36.9 % in a decade year.

Obesity, which will bring out the health risk in biological way such as hypertension or hyperglycemia, in addition, also endanger in psychological way. Being obese would have a lower self confidence, easier to be neglect from the society, bullying, or discrimination. Media, educational, commercial, and medical professions all advocate slimmer trendy, therefore people develop a "fat is not good" thought unconsciously, which turns into a stigma of obesity. Obese child or teenagers are found problems such as low self-esteem, mood disorders, and social withdrawal etc. In other words, obesity would bring oneself stressful in different cultures. Undergraduate girl were found in a research on item "self body shape cognition and worrying about body shape", showing that those girls who get a normal weight but always feel they are fatter, and would worry about their body shape in a more serious way[1]. Therefore, obesity could bring long-term problems in both biological and psychological way.

In campus, overweight students might receive some discrimination, such as the thoughts that overweight student was born lazier, having bad learning attitude, or getting rejections from classmates, finally those thoughts made the overweight students be bullied. All kinds of media and advertisement are overly conveying "slim is beauty" atmosphere and have already been received in campus. The authorities should have a special policy to build a friendly multi-body shapes school network, in case of the students be leaded by the media or make a world of "lose weight is health, fat is bad" further.

In addition, theory of Developmental Psychology mentions that girls give more attention than boys about changes in body shape in adolescence[2]. In convey of Taiwanese, one of the finding discovered that junior students are more possibly using inappropriate ways of losing weight to reach an ideal body shape, such as having vomit induced, fast, or drugs abused[3]. Therefore, this study aims at testing the obesity-related stereotype prevalence among high school girls in Taiwan.

Obesity and overweight

The body mass index (BMI), or Quetelet index, is a heuristic proxy for human body fat based on an individual's weight and height. The formula universally used in medicine produce a unit of measure of kg/m^2. BMI is an indicator commonly used to illustrate oneself who is fat or thin. The higher the value, the more fat it represents. Department of Health, Executive Yuan, R.O.C (TAIWAN) use BMI up to 24 as a mark of overweight, and BMI up to 27 as obesity. Thus $24 \leq BMI < 27$ as overweight, $27 \leq BMI < 30$ as mild obese, $30 \leq BMI < 35$ as moderate obese, and $BMI \geq 35$ as severe obese.

BMI is a calculator tool for health research originally, when we need to know whether obesity is a cause of some illness or not, we can calculate patient's height and weight into BMI to test the relationship between disease incidence and BMI. However, BMI value is just a reference value in present day, if using this reference value to discuss obesity-related stereotype or stigma, clear demarcation point maybe is not necessarily needed. So this study chooses to use image showing to represent "obesity" and "normal" conditions for lowering the cognition of the definition of fat.

Obesity-related stereotype

Being plump was symbols of wealthy, status, vigorous and graceful long time ago. In Tang Dynasty of china, plump was a standard of beauty. But nowadays, aesthetic standard is changed by Western culture and Hollywood stars, which turn into "slim is beauty" concept. And "obesity" gradually become a negative word represented lazy, stupid, lack of discipline and confidence; have low rate of morality or willpower, and unhappy etc. these thoughts of obesity form the real obesity-related stereotypes, or may probable change people's behaviors into discrimination actions.

Moreover, obesity-related stereotypes not simply exist in students, or maybe in grand ages including youth, middle-aged, or elders. It was found that child would choose a standard to thin body shape partner to stay along with in a selectable situation, and try to avoid one who is fat[4]. A questionnaire research towards coaches ran by Department of Physical Education, Hong Kong Baptist University (HKBU) in 2007, found that 75% of coaches having bad impression towards fat kids, such as lazy, foolish, lack of discipline and willpower etc. The younger the coach, the much worse impression towards fat kids was. In additions, more than 60% of male coaches think that fat kids are lazier, lack of motivation of learning, and expect their behaviors worse than the normal[5]. Otherwise, a study found that when using different words, such as fat people, gay, or Muslim, in the same time to do filling the blanks task, discovered that oneself

would be influenced by weight bias more than gay and Muslim bias[6]. Most of all, obesity-related stereotype did exist in everywhere, but there is seldom be discussed in Asia.

The impact of obesity-related stereotype

The influence of obesity-related stereotype will be explaining in the following paragraph and divide into four parts separately, such is influences in educational system, medical system, workplace, and social problems inducing.

a. *In educational system*: one finding that was investigated the preference of choosing body shape on social interaction between children was very different, such as avoid staying along with a fat kid[4]. Another study found that undergraduate students generally thought that overweight people was much lazier than normal[7]. Otherwise, teachers' expectation of different body shape students would influence other students' reaction, and made the stigma of obesity ingrained. One finding was that stereotype did influence teachers into different teaching and feedback among different body shape students, thus made the performances different between them[5,8,9].Moreover, news about bulling in campus was common to find, and most of the victims were eliminations, bullying, or been treated unfairly because of the body weight. One finding in an international research, fat kids were easily found bullied, regardless of race or sex[10]. From these findings, campus has been flooded with negative stereotypes of the weight already, and that may influence related type of students being bullied in the past and future.

b. *In medical system:* obesity patients were expected to need more time to be cured than normal weight patients among medical professions[11, 12].This manner might cause the treatment different and affected the doctors giving confidence and recommendations towards patients in curing, thus making the real curing different.

c. *In workplace:* employee's salary and wage are mysterious related to their body shape. When a study using telephone polling carried out a research, 60% of Unite State people were found having experienced discrimination because of the body shapes, including unemployed, unable to promotion, incorrectly dismissed[13]. Thus stigma of the weight subconsciously influences the workplace rules and forms an unfair treatment in any workplaces.

d. *Social problem*: Researches indicate that teenagers are unsatisfied with their appearances in general and are sensitive with that issue. They compare with each other easily, and may be influenced by media or close friends, to form a negative thinking about their appearance and finally acting in an incorrect way to change

the body shapes. In fact, whatever teenager girls' body shape actual is thin or fat; they all have eating problems and may harm their health. One finding was that high school girls pay more attentions to their appearance than boys, but feel unsatisfied and evaluated in a low evaluation to themselves than boys[14]. Otherwise, Bulimia nervosa is popularly to be found out in late adolescence and early adulthood; most are happened in girls. A local study found 13% of students had tried emetic to lose weight; emetic rate in male reaches 16% while female is 10%; emetic in pupils is 15.9%, junior high school students 15% and high school students 7.5 %[3]. In other words, teenagers are more easily because of unsatisfied with their body shape and become anxiety, and may probably using kinds of actions to change, such as drugs abused, fast and emetic inducing.

In a short summary, obesity-related stereotype have influenced the functioning of the society; kind of researches all verify the effect of stigma of weight, and this may be an issue needed to be facing. In the western cities, lots of researches have been published to discuss obesity-related stereotype. However, in Taiwan or other eastern countries, there is little study about obesity-related stereotype. Whether the first impression of obesity or slim would affect social relationship or not is seldom to be discussed neither. Therefore, the influence of obesity-related stereotype is needed to be investigated in eastern countries.

Several studies have investigated factors of influencing helping behavior. Such as smiling from a stranger enhances help giving[15], implicit bystanders could both increase and decrease helping behavior[16],and music might influence helping behavior also, one finding is that uplifting music could lead participants offering more help on high-cost task than annoying music did[17]. Other than mood or music, stereotype such as obesity-related stereotype is seldom been discussed.

Manipulation of obesity-related stereotype

When one have a regular attitude or concept in meeting the same type of people or situation, one would give out a fixed reaction or concept either. Suen's (2006) study found that manipulation of explicating the stereotype have six ways: (a) when one is in a being assessed situation; (b) explicit the groups' identification; (c) declare that ongoing tasks would have difference between groups; (d) indicate different groups definitely behave different in pros and cons; (e) compare between groups; (f) establish an Simulated Situation that accompany with others.

In this study, article reading is being used; it manipulates to explicit the groups' identification only, in other words, initiate the identification of the participants in

belonging groups. For example, Shih (1999&2002) in experiments asked participants to complete a questionnaire following an article reading; the reason why using reading is to induce the related identification of groups and stereotype, and measure the related behaviors further. Otherwise, article reading is not only used in this study to induce the obesity-related stereotype, an appropriate female body shape image is added beside the article to lower the difference of cognition between participants. In the past researches, body shape scale images in using mainly came from 1983 of Stunkard, Sorensen and Schulsinger, which is a scale of ladies with the same hairstyle or dressing, colored in black and white, and range in thin to fat from left to right side[18]. And that scale was firstly used in Fallon and Rozin's research to investigate the related body shape issue in university girl[19]. However, that scale has been used in a long time, whether it is appropriate to use nowadays in high school girls studying in Taiwan and Macau is unknown. Thus that scale is being discussed with other scales from internet which are anonymous in pilot study, for choosing the appropriate one to use in further experiment.

PILOT STUDY

For choosing the most suitable image using in both Taiwan and Macau, pilot study was set up and total 138 (66 Taiwanese and 75 Macanese) senior high school girls had participated.

Method

Three different body shape scales with 7-point likert typed scale were being evaluated, which were non-dressing body shape scale with blue background from the internet (rename "A"); ladies dressing in green colour from the internet (rename "B"); and Stunckard's figural rating scale for women (rename "C"). Otherwise, counterbalancing of scales was used to avoid order effect.

Result

Significant interaction effect between area and scale was found($F(2,139)=5.553$, $p<.05$, $\eta^2=.038$,power=.852); otherwise, a significant main effect of scales was found($F(2,139)=24.491$, $p<.001$,$\eta^2=.15$,power=1.0), after post-hoc analysis, B scale(M=5.00, SD=1.62) was found significant higher than C scale(M=4.06, SD=1.54) and A scale(M=3.29,SD=1.65)in Taiwan. On the other hand of Macau, A scale (M=3.48, SD=1.70) was found significant lower than C scale (M=4.06, SD=1.45) and B (M=4.13, SD=1.49). See Table 1, 2 and Figure 1.Therefore, B scale was thought to be the most suitable in using in both Macau and Taiwan high school girls, and images within "green" scale of "obesity body image" and "normal body image" was chosen out to use in experiment 1.

Table 1 : Summary of two-way ANOVA analysis in pilot study

Source	SS	*df*	MS	F	*p*	η^2	power
Country	5.229	1	5.229	1.541	0.217	0.011	0.234
Scale	98.947	2	49.474	24.491	0.000***	0.15	1
Country*Scale	22.437	2	11.218	5.553	0.004**	0.038	0.852
Within-subject	724.657	278					
Block	471.768	139	3.394				
Error	252.889	139	1.819				
Total	851.270	283					

Note. Country :(Macau vs. Taiwan); Scale: (A,B vs. C)

*p<.05(2-tailed) **p<.01(2-tailed) ***p<.001(2-tailed)

Table 2: Summary of variance analysis of Main Effect

Main Effect	SS	*df*	MS	F	*p*	η²	power	post-hoc
Scale								
at Taiwan	97.04	2	48.52	20.372	0.000***	0.239	1	B>C>A
at Macau	19.387	2	9.693	5.694	0.004**	0.071	0.858	A<C<B
Error(residual)	561.573	278	4.084					
Country								
at A scale	1.296	1	1.296	0.462	0.498			
at B scale	26.369	1	26.369	10.952	0.001**			
at C scale	0.001	1	0.001	0.001	0.981			
Error(residual)	724.657	278	2.607					

Note.*p<.05(2-tailed) **p<.01(2-tailed) ***p<.001(2-tailed)

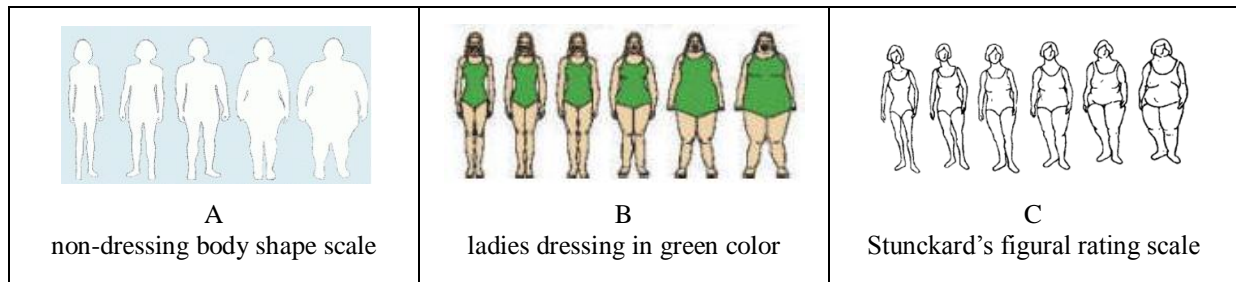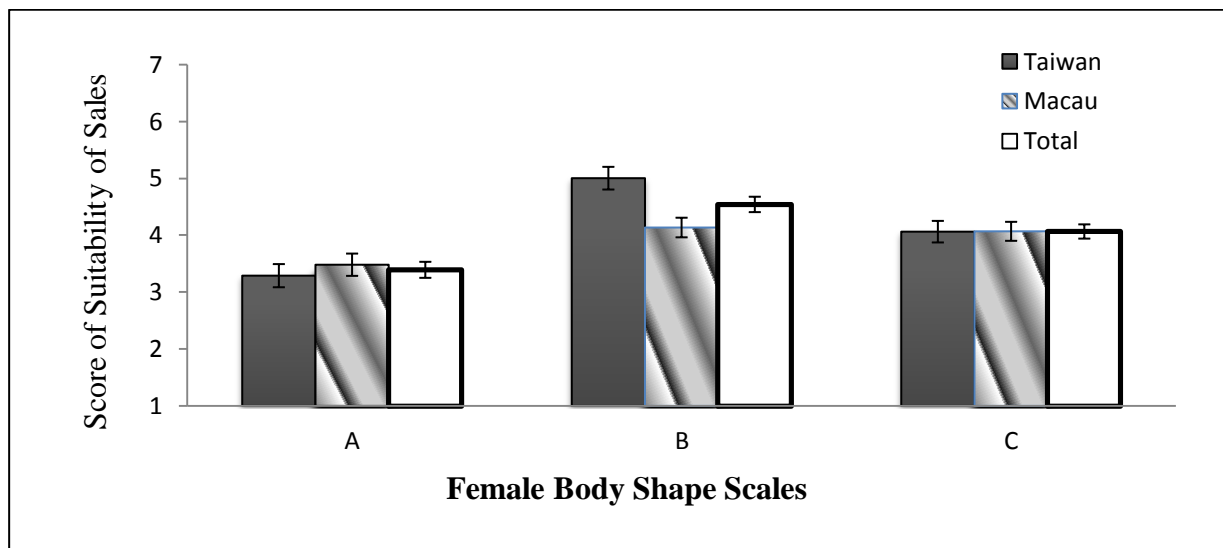| A	B	C
non-dressing body shape scale	ladies dressing in green color	Stunckard's figural rating scale

Figure 1: Scales Used in the Pilot Study

Figure 2: Comparison of the Scores among Different Body Shape Scale on High School Girls in Pilot Study

EXPERIMENT 1 – THE EVALUATIONS OF OBESITY-RELATED STEREOTYPE

METHODS

This experiment aims to set up a Chinese version of Questionnaire about obesity-related stereotype according to "Fat Stereotype Questionnaire, FSQ"[20], 9 items about obesity are extracts from FSQ, in which 3 items are contracted into one because of describing the same situation about social relationship and several items are added to fulfil this study. Statements about each item are used in a 7-point likert typed scale in a paper-way of Questionnaire, which was given to 221 senior high school girls in Taiwan (N=103)and Macau(N=118) as participants. Item analysis and factor analysis were given.

Moreover, different images are showing to participants instead of asking about the feeling of obesity for lowering the cognitive inaccuracy between participants. Each girl's height, weight, preferred weight, and score of satisfaction of self-body shape are asked at the end.

RESULTS

Demographic outcomes

In regard to demographic characteristics, the average age was 17.03 years (SD=.89). In actual BMI, 27.7% were underweight, 59.1% were normal weight, 11.4% were overweight, 1.4% was mild obesity, and 0.5% was moderate obesity.

Item-analysis

Top 27% and bottom 27% of the 206 high school girls in both Macanese and Taiwanese were taken to conduct an item-analysis; *t* test is used to find out Critical ratio (CR). Result showed that 16 items were almost significant up to .001 level or CR>3.0. Therefore, each item had a good discrimination in the study. See Table 2.

Table 2: the Critical ratio of each item in Total Questionnaire

Item	CR	Item	CR
1	7.044***	9	3.486**
2	7.649***	10	9.956***
3	3.703***	11	8.915***
4	3.318**	12	5.031***
5	5.994***	13	8.663***
6	5.648***	14	7.387***
7	9.469***	15	9.452***
8	9.165***	16	5.160***

Note.*p<.05(2-tailed) **p<.01(2-tailed) ***p<.001(2-tailed)

Factor analysis

An examination of the Kaiser-Meyer Olkin measure of sampling adequacy suggested that the sample was factorable (KMO=.777; Bartlett's test of sphericity = 1173.761, *p*<.001). A Principal Component Analysis (PCA) with a Varimax (orthogonal) rotation of 16 Likert scale questions from this questionnaire was conducted on data gathered from 221 participants. Result showed that four factors were extracted to explain 61.92% variances of the whole questionnaire. All factor loadings were more than .30; however the last factor included just only item, item 15, it should be moved out to get a better result. In addition, item 6 got a similar factor loading (variance less than 0.25) between two factors. See table 3.Therefore, two items were removed and second-time factor analysis was conducted in the following step.

The same factor analysis was conducted in the second factor analysis, which included 14 Likert scale questions. The examination of KMO measure of sampling adequacy (KMO=.762, Bartlett's test of sphericity =1009.026, *p*<.001) suggested that sample was factorable to conduct a factor analysis also. Result of analysis revealed that three factors were extracted to explain 58.54% variances of the whole questionnaire without item 6 and 15.See table 4. Factor loadings were more than .30 also, but item 2 turned to have a similar loading among two factors, which difference variance less than 0.25. Therefore item 2 was removed to conduct a further factor analysis for getting a better reasonable result.

Table 3 : First factor analysis

Items	Factor a	Factor b	Factor c	Factor d
9.She is smart	**0.84**	-0.17	-0.07	-0.02
3.She performance very well in academic	**0.76**	-0.14	-0.10	0.10
7.She is active	**0.75**	0.26	0.01	0.08
5.She is happy	**0.69**	0.09	0.01	0.00
1.She has lots of friend	**0.59**	-0.03	-0.01	0.59
13.She can control her behavior	**0.55**	0.16	0.12	0.34
8.She dislikes doing exercises	-0.04	**0.84**	-0.04	0.17
10.She is uncontrollable in eating	-0.03	**0.80**	0.20	0.09
2.She is lazy	0.17	**0.68**	0.34	-0.42
11.She is healthy	0.23	**0.57**	-0.16	0.39
16.She is uneasy to get along with	-0.01	0.02	**0.79**	0.10
4.She is not good to be	0.02	-0.09	**0.76**	-0.13
12.She lacks of responsibility	0.00	0.16	**0.72**	-0.15
14.She does not like to keep clean	-0.06	0.18	**0.71**	0.29
6.She needs helping from others	-0.10	0.42	**0.43**	0.15
15.Her appearance is attractive	0.18	0.41	0.14	**0.69**

Table 4 : Second factor analysis

Items	Factor a	Factor b	Factor c
9.She is smart	**0.80**	-0.04	-0.19
3.She performance very well in academic	**0.77**	-0.10	-0.15
7.She is active	**0.73**	0.03	0.25
1.She has lots of friend	**0.72**	-0.05	0.07
5.She is happy	**0.67**	0.00	0.07
13.She can control her behavior	**0.62**	0.12	0.26
16.She is uneasy to get along with	0.01	**0.80**	0.03
4.She is not good to be	-0.02	**0.77**	-0.16
12.She lacks of responsibility	-0.05	**0.75**	0.14
14.She does not like to keep clean	0.02	**0.70**	0.25
8.She dislikes doing exercises	-0.01	-0.01	**0.87**
10.She is uncontrollable in eating	-0.02	0.21	**0.80**
11.She is healthy	0.31	-0.14	**0.65**
2.She is lazy	0.02	0.41	**0.57**

After removing item 2, 6, and 15, the last factor analysis was conducted. The data were still considered suitable for following the multiple rules that included the Kaiser-Meyer Olkin measure of sampling adequacy (KMO=.754, and Bartlett's test of sphericity =898.033, $p<.001$).

Analysis of 13 items of the whole questionnaire revealed that three factors with eigenvalue above 1, accounting for 60.09% of the total variance. Items with loadings greater than .40 were used to characterize the factor solutions. Following the Varimax rotation, the items were examined to be assigned to a factor using the above guides were discarded. See Table 5. The three factors were labelled as follows:

The three resultant factors were descriptively labelled as indicated below. Factor 1 was given the label "Unwell Personal Performance". Six items were included, with the loadings ranging from 0.61 to .081(explained variance 25.55%). The top item within the factor was "she is smart" (loading 0.81). And factor 1 including the attitude for personal performances such as well performance of academic, being active, lots of friends, happy, and able to control ones behaviour. Because most of the six items were in reverse asking in the questionnaire, the more the scores, the higher the stereotypes were. These components illustrated the factor labelling as "Unwell Personal Performance".

Factor 2 was labelled "Poor Interpersonal Perception". There were four items that loaded on this factor, with loadings ranging from 0.73 to 0.81(explained variance 20.38%). The top item within the factor was "she is uneasy to get along with" (loading 0.81). Factor 2 included characteristics such as lack of responsibility, one is not good to be, and one who does not like to keep clean. These characteristics emphasized the factor labelling as "Poor Interpersonal Perception".

Factor 3 was given the label "Inappropriate Life Style". There were three items concluded in this factor, with the loading ranging from 0.68 to 0.86 (explained variance 14.17%). The top item within the factor was "she dislikes doing exercises" (loading 0.86). Factor 3 included characteristics such as uncontrollable of eating and unhealthy. These characteristics illustrated the factor labelling as "Inappropriate Life Style".

Furthermore, Cronbach's α coefficient was used to assess the internal consistency of each of the three factors identified from the last PCA. All of the three factors were above .70, demonstrating a good internal consistency between factors. Result showed that Factor 1(α=.81), Factor2 (α=.75), Factor 3(α=.73), and Total Scale (α=.71) was adequate.

Table 5 : Third factor analysis

Items	Factor 1	Factor 2	Factor 3
9.She is smart	**0.81**	-0.07	-0.21
3.She performance very well in academic	**0.77**	-0.12	-0.16
7.She is active	**0.73**	0.03	0.24
1.She has lots of friend	**0.72**	-0.03	0.12
5.She is happy	**0.67**	0.00	0.07
13.She can control her behavior	**0.61**	0.14	0.29
16.She is uneasy to get along with	0.01	**0.81**	0.02
4.She is not good to be	-0.02	**0.75**	-0.21
12.She lacks of responsibility	-0.05	**0.75**	0.10
14.She does not like to keep clean	0.01	**0.73**	0.27
8.She dislikes doing exercises	-0.02	0.02	**0.86**
10.She is uncontrollable in eating	-0.03	0.24	**0.78**
11.She is healthy	0.30	-0.11	**0.68**
Eigen values	3.32	2.65	1.84
Percent variance	25.55	20.38	14.17
Cumulative % of the total variance			**(60.09)**
Correlation Coefficient		-0.21	.177**
			.119

Note. Factor 1= Unwell Personal Performance; Factor 2 = Poor Interpersonal Perception; Factor 3= Inappropriate Life Style. *p<.05, **p<.01, ***p<.001.

Relation among stereotype threat group and control group

No interaction effect existed among scales in different types of images used in questionnaire and countries. In addition, there were no significant differences in country ways neither, demonstrating difference of Taiwan and Macau were very little. For control, the evaluation scores of the whole questionnaire was significant different between obesity-related stereotype threat group (*M*=50.37, SD=7.70) and normal weight control group (*M*=43.72, SD=8.24) around high school girls, F (1, 207) =35.89 (*p*<.001). Besides the whole scale, Inappropriate Life Style scale was significant different among threat group (*M*=15.80, SD=3.02) and control group (*M*=10.13, SD=3.09) also, $F_{(1,207)}$ =177.92 (*p*<.001). Of note, although Unwell Personal Performance scale and Poor Interpersonal Perception scale did not have a significant difference, items among those two subscales still revealed some significant in threat and control groups. See table 6 and table 7.

Table 6 : Two-way AONVA Analysis Summary

Scale	Source	SS	df	MS	F	p	η²	power
Total Scale	country[1]	193.88	1	193.88	3.07	0.081	0.01	0.41
	type[2]	2269.79	1	2269.79	35.89	**0.000*****	0.15	1.00
	country x type	3.53	1	3.53	0.06	0.814	0.00	0.06
Unwell Personal Performance	country[1]	107.05	1	107.05	3.49	0.063	0.02	0.46
	type[2]	42.69	1	42.69	1.39	0.239	0.01	0.22
	country x type	41.71	1	41.71	1.36	0.245	0.01	0.21
Poor Interpersonal Perception	country[1]	1.38	1	1.38	0.09	0.761	0.00	0.06
	type[2]	0.23	1	0.23	0.02	0.902	0.00	0.05
	country x type	37.22	1	37.22	2.51	0.114	0.01	0.35
Inappropriate Life Style	country[1]	22.57	1	22.57	2.43	0.120	0.01	0.34
	type[2]	1651.00	1	1651.00	177.92	**0.000*****	0.46	1.00
	country x type	4.99	1	4.99	0.54	0.464	0.00	0.11

Note. 1: country (Taiwan vs. Macau); 2: type (threat vs. control).*p<.05, **p<.01, ***p<.001.

Table 7 : ANOVA Analysis of Different Type (threat vs. control)

Scale	items	SS	df	MS	F	p	η²	power
Unwell Personal Performance	1	8.70	1	8.70	5.66	**0.02***	0.03	0.66
	3	1.44	1	1.44	1.13	0.29	0.01	0.18
	5	1.67	1	1.67	0.86	0.35	0.00	0.15
	7	7.10	1	7.10	4.66	**0.03***	0.02	0.57
	9	2.14	1	2.14	1.49	0.22	0.01	0.23
	13	9.05	1	9.05	4.59	**0.03***	0.02	0.57
Poor Interpersonal Perception	4	8.71	1	8.71	4.84	**0.03***	0.02	0.59
	12	0.00	1	0.00	0.00	0.97	0.00	0.05
	14	9.25	1	9.25	5.63	**0.02***	0.03	0.66
	16	0.05	1	0.05	0.04	0.84	0.00	0.05

Note. *p<.05, **p<.01, ***p<.001.

Relationship of Actual BMI and Ideal BMI

Participates' weight, ideal weight and height were asked in the end of the questionnaire to see whether there were a relationship between them. After, ones' own actual BMI and ideal BMI were calculated and a simple regression analysis was conducted, in which actual BMI was used to predict the evaluation of the ideal BMI

high school girls want to be. And result showed that Multiple R and β were both .719, $p<.001$. In addition, R^2 indicated that using actual BMI to predict ideal BMI could explain 62.5% of the variance, F $(1,218)$ $=363.64$, $p<.001$. Result of coefficient showed that actual BMI could efficiently predict ideal BMI, β$=.719$ (t=19.07, $p<.001$). It demonstrated that higher the actual BMI score, the higher the ideal BMI girls want to be. Of note, it appeared a trendy to seek slim among them also, see Figure 3.
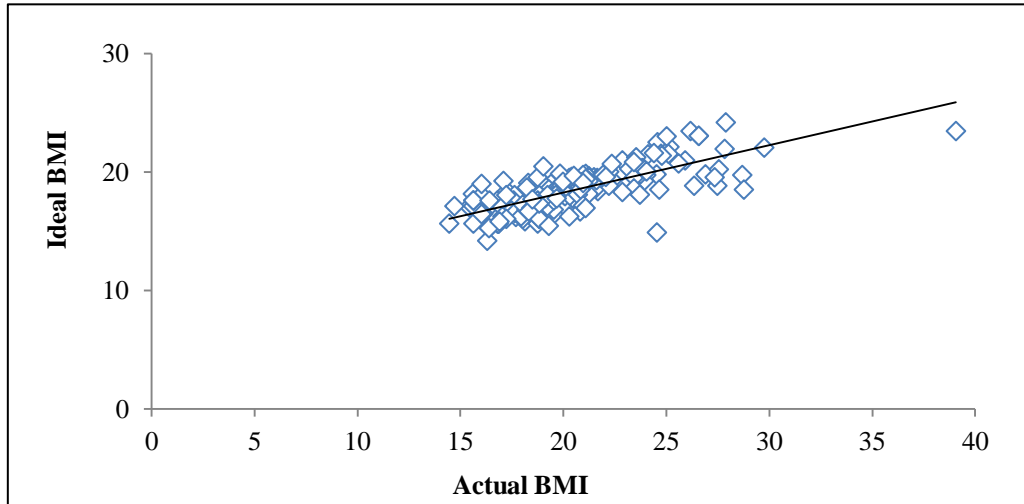

Figure 3: the Regression of Actual BMI and Ideal BMI

CONCLUSION

The evaluation scores of experiment 1 was significant different between obesity-related threat group and normal weight control group, no matter which counties they were in. The questionnaire was set up for the test, showing that the obesity-related stereotype did exist, and the higher the score, the higher the stigma was. Therefore, all the matieral used here was the same except the images beside the questionnarie, leading that obesity-related stereotye was carrying on in the participant.

One more interested finding that was actual BMI cound predict ideal BMI ,although the relationship was in a postive way, however the result appeared a seeking slim trendency. It meant that whatever BMI the girls were, seeking a higher BMI scores within a slim range was provided.

EXPERIMENT 2 – THE HELPING BEHAVIOR OF OBESITY-RELATED STEREOTYPE

PARTICIPANT

Totally 241 high school girls in took part in this research, 122 Taiwanese and 119 Macanese. All participants were randomly assigned to three conditions, which were Threats, Control, and No Figure condition. Different design used to estimate the level of willingness to help the "victim" with different body shapes within the same story.

METHODS

Article reading was used to induce the related identification of groups and stereotype, and level of willingness was measured further after the article reading. Otherwise, an appropriate female body shape image is placed beside the article to lower the difference of cognition between participants. Therefore, an overweight figure image was used in Threats condition, normal weight figure in Control conditions, and no figure was supplied in No Figure condition.

Moreover, articles in three conditions were the same, which was describing a girl who needed funding for school fee. Except the images showing beside the article, no information of the body shape described was supplied throughout the article.

Questions of multiple choices were asked following the article reading to check whether the participants took serious in reading. Then five questions were further asked in 7-point likert scale after article reading: a) the level of willingness of giving some kind of help to her; b) the level of asking her living conditions actively when she was your classmate; c) the level of agreeing that the article describing girl did need help; d) the agreeing level of article describing girl should be helped; and e) the level of trusting that the article was actually real.

For testing whether "mood" would influence helping, mood scales were showing, that was scale consisted levels of sadness to happiness cartoon, were supplied before and after the article. In which levels of sadness to happiness cartoon were showing, instead of asking participant the feeling before and after the article.

Finally height, weight, and ideal weight were asked at the end of the questionnaire, which were transformed to BMI to explore the relationship between them later.

RESULT

Three participant's error rate up to 60% in answering of multiple choice questions

following the article reading was excluded before the data analyzing. Therefore, 238 data left to run the following analysis, including two-way analysis of variance of five main questions after the reading, *t* analysis of the mood before and after, and the correlation coefficient analysis of mood and willingness of helping the story girl.

Five main questions:

a) The level of willingness of giving some kind of help to her

Comparing two countries and three conditions, the statistical analysis reveal result as a main effect on country on the questions of giving help ($F_{(1,237)}$=19.25, *p*<.05), showing that Taiwan(M=5.85) and Macau(M=5.14) got significant in giving help. However, responses to help the article describing girl measure indicated a ceiling effect with almost all participants offering high willingness to help, difference between two countries come from the level of giving help. See table 8.

Table 8: Two-way Analysis of Variance Summary in Willing to Give Help

Source	SS	*df*	MS	F	*p*	η^2	power
Country	28.84	1	28.84	19.25	0.00**	0.08	0.99
Condition	6.42	2	3.21	2.14	0.12	0.02	0.44
Country x Condition	5.91	2	2.96	1.97	0.14	0.02	0.41
Error	347.48	232	1.50				
Total	389.50	237					

Note. Country :(Taiwan vs. Macau); Condition: (threats, control vs. no figure).
 *p<.05(2-tailed) **p<.01(2-tailed) ***p<.001(2-tailed)

b) The level of asking her living conditions actively when she was your classmate

Comparing two countries and three conditions, the statistical analysis reveal a marginally signification interaction effect ($F_{(2,237)}$ =2.57, *p*=.08) between countries and conditions. Otherwise, there were no main effects presented in asking her living conditions actively. See table 9.

Table 9: Two-way Analysis of Variance Summary in Asking Her Living Condition

Source	SS	*df*	MS	F	*p*	η^2	power
Country	1.54	1	1.54	0.76	0.38	0.00	0.14
Condition	3.54	2	1.77	0.87	0.42	0.01	0.20
Country x Condition	10.44	2	5.22	2.57	0.08	0.02	0.51
Error	472.04	232	2.03				
Total	487.58	237					

Note. Country :(Taiwan vs. Macau); Condition: (threats, control vs. no figure).

c) The level of agreeing that the article describing girl did need help

Comparing two countries and three conditions, the results of two-way ANOVA reveal a significant interaction effect ($F_{(2,237)}$ =6.34, p=.002) between countries and conditions. Moreover, simple main effect of countries was found when the obese body shape image showed in the threats group, Taiwanese (M=6.33, S.D. =0.87) agreeing more than Macanese (M=5.62, SD =1.37) significantly, $F_{(1, 77)}$ =7.647, p=.007. Another simple main effect of conditions was found when participants were Taiwanese, conditions without images beside (M=5.67, S.D. =1.39) got the lowest agreeing than the standard (M=6.10, SD=0.99) or obese (M=6.33, SD=0.87) body images hold on in the article after the post hoc analysis of the item in agreeing the describing girl did need help, $F_{(2,120)}$=3.686, p=.028. See table10 and table 11.

Table 10: Two-way Analysis of Variance Summary in Agreeing the Girl did Need Help

Source	SS	df	MS	F	p	η^2	power
Country	1.11	1	1.11	0.94	0.33	0.00	0.16
Condition	0.21	2	0.11	0.09	0.92	0.00	0.06
Country x Condition	15.10	2	7.55	6.34	0.00**	0.05	0.90
Error	276.24	232	1.19				
Total	292.66	237					

Note. Country :(Taiwan vs. Macau); Condition: (threats, control vs. no figure).
*p<.05(2-tailed) **p<.01(2-tailed) ***p<.001(2-tailed)

Table11: Simple Main Effects Analysis Summary in Agreeing the Girl did Need Help

Source	SS	df	MS	F	p
Country					
Macau	6.23	2	3.11	2.76	0.07
Taiwan	9.23	2	4.61	3.69	0.03*
Condition					
obese body shape	10.05	1	10.05	7.65	0.01*
standard body shape	0.81	1	0.81	0.96	0.33
no image	5.24	1	5.24	3.73	0.06
Error	276.24	232	1.19		

Note.*p<.05(2-tailed) **p<.01(2-tailed) ***p<.001(2-tailed)

d) The agreeing level of article describing girl should be helped

Comparing two countries and three conditions, the statistical analysis reveal result as a main effect on country on the questions of agreeing the girl should be helped, showing that there were no interaction effect or main effect existed in both country and conditions ways. See table 12.

Table 12: Two-way Analysis of Variance Summary in Agreeing the Girl Should Be Helped

Source	SS	df	MS	F	p	η²	power
Country	0.25	1	0.25	0.12	0.72	0.00	0.06
Condition	4.51	2	2.25	1.12	0.33	0.01	0.25
Country x Condition	6.00	2	3.00	1.49	0.23	0.01	0.32
Error	462.03	230	2.01				
Total	472.42	235					

Note. Country :(Taiwan vs. Macau); Condition: (threats, control vs. no figure).

e) The level of trusting that the article was actually real

Comparing two countries and three conditions, although the conditions almost be significant , the statistical analysis still reveal as no main effect on country on the questions of agreeing the article was true, showing that there were no interaction effect or main effect existed in both country and condition ways. See table 13.

Table13: Two-way Analysis of Variance Summary in Trusting the Article

Source	SS	df	MS	F	p	η²	power
Country	1.11	1	1.11	0.60	0.44	0.00	0.12
Condition	8.88	2	4.44	2.39	0.09	0.02	0.48
Country x Condition	2.29	2	1.14	0.62	0.54	0.01	0.15
Error	430.53	232	1.86				
Total	443.35	237					

Note. Country :(Taiwan vs. Macau); Condition: (threats, control vs. no figure).

Mood before and after Reading:

Before and after the article, the mood scale was supplied twice whether the feeling of the participants were changing. The result of t analysis showed that $t_{(232)} = 8.315$, p<.001, meant that mood before reading (M=4.79, SD =1.33) was significant to the mood after (M=4.15, SD =1.10).The result revealed that the mood almost changing badly after reading the helping needed girl article.

Mood and helping:

The correlation of willingness in giving help and mood in before and after reading the article showed that the mood before the reading was much better. The analysis of Pearson's *r* showed that moods related in a strong way (r=.545, *p*=.000) in before and after. Otherwise, willing to give help was related to the mood before reading in a very significant positive way (r=.258, *p*=.000), but cannot see this sign in the mood after reading (r=.096, *p*=.145). Showing that, the mood before the test might be mainly influenced the mood changing and helps giving.

CONCLUSION

Five main question results revealed that only one question about willing to help exist that the countries different between Taiwan and Macau. Otherwise, there were almost no differences between them. The only one difference seemed to present a ceiling effect that participants between two countries were both willing to help, but had a significant of that "willing" level. On the other hand, mood before and after reading the article showed a significant changing worse, implied that the participants might feel sad to the story girl. One more finding showed that the mood before the article reading had a significant correlation with the willingness to give help later.

DISCUSSION

From the experiment 1, the effect of the obesity-related stereotype was existed in both Taiwan and Macau high school girls. The result showing that that kind of stereotype manipulating was usable to carry on the testing, implied that even though just an image of a lady body shape, it could activate the stereotype. And one finding of BMI was that actual BMI could predict ideal BMI, which was higher the actual way, the higher the ideal the girls wanted, however, the ideal BMI was still range in the slim tendency, implied that whatever weight girls got, they all wanted to be fatter in the slim-standard range only.

On the hand of the experiment 2, results showed that two countries were significant in willingness of helping the story girl. It seemed that was the ceiling effect was cover the real stuff, because both countries score means were all over five points in seven-point scale, meaning that girls in two places were both willing to give help, just in different level. Another interesting phenomenon was that the mood before the experiment got a significant correlation in willingness of giving help in further; therefore the mood could influence the willingness to help. In the future study, the mood of the participant better been precluded in the related research of helping behavior.

Limitations: (1) All the participants were high school girls; boys of obesity-related stereotype may be different in other ways, so the result might be different towards boys. (2) Cultures were different among different Asia countries, and only two countries were taken part in this study, inferring the result to other Asia countries might inappropriate to be.

References

1. Zhang SZ (1987) A study of body image, physical index, health and eating life of female students in a selected university. Institute of Public Health, National Yang-Ming University. Not published.

2. Papalia DE, Olds SW & Feldman RD (2008).Human Development. *McGraw-Hill Humanities Social Press.*

3. Liou YM, Hsu YW, Ho JF, Lin CH, Hsu WY &Liou TH (2012) Prevalence and correlates of self-induced vomiting as weight-control strategy among adolescents in Taiwan. *Journal of Clinical Nursing.*P.11–20, January 2012.

4. Latner, JD, &Stunkard, A J (2003)Getting worse: the stigmatization of obese children. *Obesity Research* (2003) 11, 452–456.

5. Chow, BC, McKenzie, TL, & Louie, L(2008).Children's physical activity and environmental influences during elementary school physical education. *Journal* of *Teaching Physical Education*, 27(1):38-50.

6. Latner JD, O'Brien KS, Durso LE, Brinkman LA & MacDonald T (2008)Weighing obesity stigma: the relative strength of different forms of bias. *International Journal of Obesity* (2008) 32, 1145–1152.

7. Wang SS, Brownell KD, & Wadden TA (2004) the influence of the stigma of obesity on overweight individuals. *International Journal of Obesity* (2004) 28, 1333–1337.

8. Greenleaf C &Weiller K (2005) Perceptions of youth obesity among physical educators. *Social Psychology of Education* Volume 8, Number 4, 407-423.

9. Greenleaf C, Martin SB & Rhea D (2008) Fighting Fat: How Do Fat Stereotypes Influence Beliefs About Physical Education? *Obesity* 16, S53–S59

10. Lumeng JC (2010) Weight status as a predictor of being bullied in third through sixth grades. *Pediatrics* Vol. 125 No. 6 June 1, 2010. 1301-1307

11. Schwartz MB, Chambliss HO, Brownell KD, Blair SN, & Billington C(2003) Weight bias among health professionals specializing in obesity. *Obesity Research* (2003) 11, 1033–1039.

12. Teachman BA & Brownell KD (2001).Implicit anti-fat bias among health professionals: is anyone immune? *International Journal of Obesity, 25, 1-7.*

13. Puhl RM, Andreyeva T & Brownell, KD(2008) Perceptions of weight discrimination: prevalence and comparison to race and gender discrimination in America. *International Journal of Obesity 2008; 32:992-1000.*

14. Wen HL& Huang YC (2004) Body image and weight reduction intention of students in the senior high and vocational schools. *Journal of Health Education(Taiwan),* Vol 22, Dec2004, p157-175.

15.Guéguen N, & De Gail M-A (2003) the effect of smiling on helping

behavior: Smiling and good Samaritan behavior. *Communication Reports*, 16(2), 133-140.

16. Garcia SM, Weaver K, Darley JM, & Spence BT (2009) Dual effects of implicit bystanders: Inhibiting vs. facilitating helping behavior. *Journal of Consumer Psychology*, *19(2)*, *April 2009*, *215-224.*

17. North AC, Tarrant M, & Hargreaves DJ (2004) The Effects of Music on Helping Behavior: A Field Study. *Environment and Behavior,* March 2004, 36:266-275.

18. Stunckard AJ, Sorensen T & Schulsinger F (1983) Use of the Danish adoption register for the study of obesity and thinness. In S. Kety (ed.), *the genetics of neurological and psychiatric disorders*. New York: Raven Press.

19. Fallon AE & Rozin P (1985). Sex differences in perceptions of desirable body shape. *Journal of Abnormal Psychology*, Vol 94(1), Feb 1985, 102-105.

20. Davison K, & Birch L (2004) Predictors of fat stereotypes among 9-year-old girls and their parents. *Obesity Research* (2004), 12:86-94.