

Using Semantic Differential to Study Expected Images Expect Vocabulary on Design and Lifestyle Ethnic Groups

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Abstract The appeal of consumers choosing their products has changed from being functionally practical to sensational, and sensation has already become the main motivation for consumers to choose their products. Also, lifestyle ethnic groups are the most favorable analyzed subjects of marketing currently, so making good use of ethnic lifestyle group analysis to penetrate the consumer market in Taiwan will be helpful for operators of different industries to realize the characteristics of potential consumers. In the future, all kinds of lifestyle ethnic groups will be targeted to conduct deeper observation, investigation, and research of specific themed products or services. This research will hold 2 expert group seminars respectively through literature review, expert group seminars, and Method of Semantic Differential, and 131 total questionnaires will be distributed in two batches to implement a three-phase experimental survey and conduct research on three lifestyle ethnic groups and their corresponding Semantic Differential. The research results obtained the 31 most commonly used Semantic Differentials on design, and the 3 most often encountered lifestyle ethnic groups on design, which are LOHAS, the technology group, and texture group. Meanwhile, the respective image expect vocabulary of the three lifestyle ethnic groups will also be obtained, for example, the images expect vocabulary of LOHAS is practical, simple, and organic. The images expect vocabulary of the technology group is versatile, streamlined, innovative, and technological. The images expect vocabulary of the texture group is fashionable, popular, luxurious, and abstract. Through the results of the research, we can also obtain that (1) different lifestyle ethnic groups actually have different corresponding Semantic Differentials, and (2) not all of the commonly used Semantic Differentials on design are suitable for different lifestyle ethnic consumption groups, so the extraction of Semantic Differentials should actually be put in more detailed divisions. Moreover, (3) the Semantic Differentials decided by different designers on different lifestyle ethnic groups might lead to the distortion of the extraction of designing elements because the deciding process is too rough. Also, (4) the research of the relevance among different lifestyle ethnic groups, Semantic Differentials, and images can be conducted subsequently, and the e-platform of an image billboard can be constructed to be a tool able to support and operate during design.

Keywords Lifestyle ethnic groups, Image expect vocabulary, Semantic Differential

1. Introduction

In recent years, the appeal of consumers choosing their products has changed from being functionally practical to sensational, and sensation has already become the main motivation for consumers to choose their products. One of the targets for product design is to arouse the motivation of consumers to purchase products, so the sensational appeal of products becomes a very important core in the design. In order to reach the goal, designers often introduce many different methods in the process of design to stimulate the

design thinking, and the implementation of an image billboard is one of the most common methods. A visualized image billboard is more direct and more imaginative, which can trigger ideas quickly, boost the efficiency of the communication between designers and clients, and condense and integrate the consensus of the designing team. During the product design, the implementation of an image billboard not only can inspire more innovation during development but also be a reference for planning the diversification of products and development of separate products.

Lifestyle ethnic groups are currently the most common consumer behavior analysis in marketing. For example, Eastern Online Co. Ltd. and the NCCU MBA program combine to create E-ICP Eastern Integrated Consumer Profiles (2016) to provide the data for consumer market

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analysis every year through large household surveys of Taiwanese consumer subject lifestyle research. The results of this lifestyle research can depict the characteristics of high potential consumers more precisely and analyze which group the customers that the operators want to contact belong to. Therefore, making good use of ethnic lifestyle group analysis to penetrate the consumer market in Taiwan will be helpful for operators of different industries to realize the characteristics of potential consumers. In the future, all kinds of lifestyle ethnic groups will be targeted to conduct deeper observation, investigation, and research on specific themed products or services.

The Semantic Differential that operates an image billboard has much research conducting extraction of Semantic Differentials based on the characteristics of products, which less matches and pairs with lifestyle ethnic groups having the current characteristics of consumers. The intention of the research preliminarily explores Semantic Differentials and lifestyle ethnic groups, matches them through expert seminars and uses them as the basis of the database for Semantic Differentials and lifestyle ethnic groups, and they can also be the reference for designers or the industry to develop or orient products in the future. Moreover, they can also be used as tools during the operation of design courses academically.

The project takes the lifestyle billboard with larger dimensions, proposed by the research results of Baxter, as the main research subject to construct the relevant Semantic Differential database of lifestyle consuming ethnic groups respectively and solve the problem that collecting Semantic Differentials is decided subjectively by designers and cannot be combined with the current lifestyles of consumer groups. The research is based on a survey of the Semantic Differentials commonly used by designers and supplemented by the Semantic Differentials corresponding to the characteristics of lifestyle ethnic groups. The obtained results can improve the expectations of lifestyle ethnic groups and the appropriateness of the Semantic Differential expression, so the results of this research are suitable for cooperative design or participatory design and are able to solve the problems of image cognition difference of different participants. The targets reached in this research are as follows:

1. Find out the lifestyle ethnic groups commonly used for product design
2. Obtain the images commonly used in all kinds of product design
3. Obtain the images corresponding to different lifestyle ethnic groups.

The process of designing or orienting the development of products always requires a larger amount of time to collect relevant information and it is possible that the expected ideal of design cannot be reached. By the construction of a database for image billboards, providing the appropriate Semantic Differential, ethnic lifestyle group, and other relevant information enables designers to obtain the most proper design image decision and to help designers to get

the best design referring factors.

In light of there currently being powerful search engines on the internet, searching for the relevant information is done by using keyword searches to promptly obtain and decide the precise Semantic Differential as the basis of keyword searches. Meanwhile, it can also be combined with lifestyle ethnic groups and be seen as the preliminary research exploration of designing innovative tools. The construction of the database corresponding to lifestyle ethnic groups and Semantic Differentials in this research is done by taking lifestyle ethnic groups as the entry point and taking human living patterns to conduct the data collection of Semantic Differentials, which is an innovative method to construct a database and an innovative highlight on the foresight of the designing and exploring phase.

2. Literature Review

The generation of images can be divided into two methods. One of them is obtained directly from their own culture, including life experience, social customs and regulations, life background, and so on. The other one is cognition that conveys images to the brain through indirect stimulation, such as the imagination after reading an article, the thoughts after appreciating an art work, and so on. Therefore, we can say that images are objectively the processed image formed in the thinking space after the cognitive subject contacts the objective things and transmits the image data according to the source of feelings. Furthermore, the overall structure of the physical memory trace left in the brain can be divided into the internal and external parts, and the internal part is meaning and the external part is symbol (Wikipedia, 2014), while most scholars from different fields think that image consists of cognitive and affective (Dobni & Zinkhan, 1990), including cognitive image and affective image. Cognitive image is the personal attitude and perception, and affective image is the personal recognition of image properties and characteristics (Martine, 2007). The Japanese kansei engineering expert, Mitsuo Nagamichi (1995), also proposed that images are abstract and non-concrete and the association of images is related to the life experiences and cultural background of consumers. In other words, images are closely related to personal lifestyles.

The product itself includes “meaning” and “symbol.” To the design activity, meaning is the implementation of the design concepts from the designers and the conveyance of designing messages, while to consumers, it is the meaning that consumers feel about the sign. In particular, it is also the product language. Symbol is the concrete presentation of the product style (Ping-Chieh Chang, 2005). The conveyance of image is to send messages to consumers through products, so the same message will generate different images to different consumers because consumers have different life background, experiences, education levels, knowledge, and so on. The cognition of images is a kind of mental activity, and the identifying process of the product image is guided mainly in two ways (Ping-Chieh

Chang, 2005), which is the overall image identification of people to the products and the overall image obtained from the analysis of the product characteristics. Wei-Yu Chen (2000) proposed the communication and conveyance pattern between designers and users (figure 1) and thought that products are the carrier to convey the image of designers and the important symbol and instruction of feeling is the consuming message and communication.

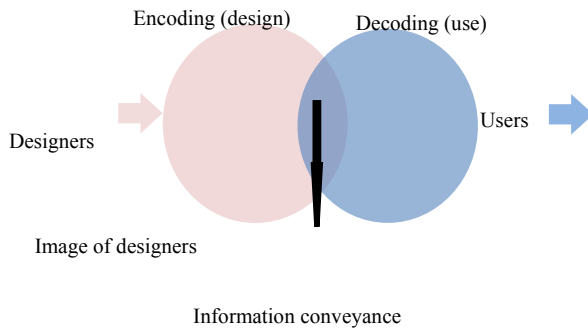


Figure 1. The communication and conveyance pattern between designers and users (Wei-Yu Chen, 2000)

The theory of lifestyles is based on “personal cognitive structure theory” proposed by Kelly in 1955, explaining how people organize their own worlds in their hearts according to a personal cognitive structure. Lazer (1963) defined the lifestyles as the following, “which is a series of concepts, and a kind of behavior presented concretely in life by the society or certain group with different characteristics from other groups in the society. Therefore, life is the result caused by culture, values, resources, law, and other powers, and the purchasing and consumption of consumers are the lifestyles that reflect the society.”

Enggel, Blackwell & Kollat (1982) thought that lifestyle is the comprehensive presentation of personal values and personality traits, which is also the method of how people spend their money and time in their lives. Hawkins, Best, & Coney (2001) thought that lifestyle means how a person lead a living, which is deeply influenced by culture, values, variables of population statistics, social status, referred groups, family, personality, motivation, cognition, learning, marketing activities, and other layers, and the purchasing decision of consumers will further be influenced. Moreover, consumers also get the feedback and experiences in the process of product purchasing decisions to develop unique personal lifestyles. Blackwell & Kollat (1982) proposed that the purchase decision of consumers is not only influenced by past experience, reputation, and purchasing needs but also changes due to the difference of lifestyles. Therefore, we can know that exploring the lifestyles of consumers is helpful for realizing the needs of users and expanding marketing.

Osgood (1957) proposed a Semantic Differential Scale on the research of product image research, and the method is to survey the subjective evaluation of the subjects and to quantify the feeling of stimulants so that we can get the

images of products. Osgood divided the images of products into three kinds of properties, which are identity, structure, and semantic.

In addition, we divide the semantic by the semantic space of the relative adjectives to evaluate the emotional meaning of an idea or concept to a person. The method was developed by C.E. Osgood (1952, 1957) and P.R. Hofstätter (1957) together, which divided the series of concept in one aspect into phases, which are usually 7 but flexible. Next, use factor analysis to find the judge for emotion. The rating scale points to positive and negative directions, and collects the evaluation of certain people to a concept to decide the average value. There are concepts P.R. Hofstätter used to divide personality factors, and three of them were identified, which are positive extrovert, negative extrovert, and introvert. Osgood simplified the scale into three aspects, which are (1) evaluation (good-bad), (2) potency (strong – weak), and (3) activity (fast – slow). There are 76 total pairing adjectives of the standard factors. Chieh-Hou Huang thought that the semantic structure factors of Chinese adjectives are also similar to this. Therefore, in general research, researchers only need to pick several standard items to apply in the standard factors. The adjectives expected to be adopted in this research are the pairs of adjectives that people are familiar with, and eight pairs of adjectives are chosen per aspect.

Table 1. Standard factors of the semantic items of Osgood

Evaluation		Potency		Activity	
Good	Bad	Strong	Weak	Active	Passive
Happy	Unhappy	Soft	Hard	Nervous	Relaxed
Positive	Negative	Heavy	Light	Aroused	Calm
Optimistic	Pessimistic	Thick	Thin	Noisy	Quiet
Bright	Dark	Rugged	Exquisite	Fast	Slow
Special	General	Large	Small	Hot	Cold
Excellent	Poor	Masculine	Feminine	Sharp	Blunt
Elegant	Vulgar	Strict	Lenient	Excited	Tranquil

One who evaluates concepts can decide his or her evaluation based on personal subjectivity. For example, the following three pairs of adjectives can be used for “school life”, and the evaluated level allows us to know the attitude of the subject toward school life. Using the three aspects of the Osgood scale, we can obtain the corresponding relationship between Semantic Differentials in design and ethnic lifestyle group.

3. Methods

In order to efficiently and definitely explore the themed lifestyle of this research and construct a Semantic Differential database, this research refers to the related information through literature review, such as the research and survey methods to use, the sample types to use, the methods to handle stimulation, the experiment process and steps, and others in related research. We plan a three-phase

survey and research process by this and explore them by the order of 1. The commonly used Semantic Differential, 2. The commonly used Semantic Differential in lifestyle ethnic groups for all kinds of products, and 3. The Semantic Differential corresponding to different lifestyle ethnic groups. The following will explain the research methods and purposes of every phase.

3.1. The Survey of Commonly Used Semantic Differentials in Design

The research target in the first phase is mainly to survey the commonly used Semantic Differentials in design through collecting the commonly used Semantic Differentials in lifestyle ethnic groups and those in the design of all kinds of products. The adopted research methods are mainly literature review and questionnaire surveys. First, collect a great amount of Semantic Differentials related to design from literature, data, newspapers, magazines, and others, and adopt the commonly used Semantic Differential on product design proposed by Tai-Sheng Huang (2007) as the basis according to the commonly used design semantic by designers from literature review.

Table 2. Basic information of the subjects in the survey of commonly used Semantic Differentials in design

Category	Number of people	Percentage
Status		
Community	17	65.38
Students	9	34.62
Gender		
Male	8	30.77
Female	18	69.23
Background		
With design background	12	46.15
Without design background	14	53.85
Age		
19~24	6	23.08
25~30	6	23.08
31~35	7	26.92
36~40	4	15.38
41~45	3	11.54

Moreover, considering that Semantic Differentials will change slightly as time goes by, we designed another open-ended questionnaire and invited the subjects with and without a design background to fill in the questionnaire online in order to collect Semantic Differentials in design extensively. The subjects in this phase were chosen by random sampling to fill in the questionnaire online. The tool is an open-ended questionnaire designed by the research team, and the basic information of the 26 subjects is shown as table 2. Collecting and organizing the final results of both, we obtained the most commonly used Semantic

Differentials.

3.2. The Survey of Commonly Used Semantic Differentials in All Kinds of Products for Lifestyle Ethnic Groups

The target of the second phase is to collect the commonly used lifestyle ethnic groups in all kinds of products and the images expect vocabulary of the groups. The research methods adopted are literature survey and expert group seminars. According to the results of the literature survey, the basic information of the ethnic lifestyle group adopts E-ICPs (Eastern Integrated Consumer Profiles), which are the result of cooperation between Eastern Online Co. Ltd. and the NCCU MBA program. Emphasizing the survey of consumer information's lack of objectivity and comprehensiveness in the domestic marketing environment, E-ICP belongs to long-term research and has conducted the survey of consumer lifestyle and consumption behaviors in Taiwan every year since 1988 and it can definitely be tested by its validity, which has now become the database of the research of consumer lifestyles covering the most area in Taiwan. The survey is an integrated survey taking 2000 consumers as the center, and the survey aspects cover population statistics, lifestyles, daily leisure, media contact, and real product purchases. The survey results of the research that objectively collects the complete aspects of the consumer lifestyle in 2015 divided lifestyle ethnic groups into seven major categories, and the nine lifestyle ethnic groups are shown as figure 2.

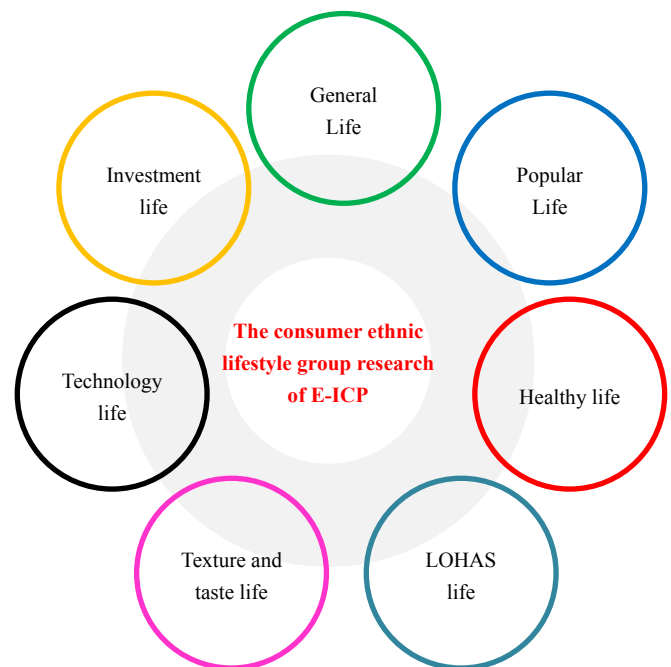


Figure 2. E-ICP research result of consumer ethnic lifestyle group (Eastern Online Co. Ltd., 2015)

In order to make the design aspects as wide as possible, we especially refer to the design categories of international design competitions, such as IF, Red Dot, IDEA, and others. Meanwhile, we consider that the design categories need to

be familiar design fields, so the chosen categories include six designers respectively for kitchen utensil design, furniture design, transportation design, computer equipment design, communication equipment design, and industrial machinery and equipment design to be the experts in this phase (shown as table 3). They picked the commonly used semantics in design and the commonly used lifestyle ethnic groups in design according to the survey results in the first phase. The adopted tool is to make Semantic Differentials into word cards (size is 92 x 56 mm) and use them to be the hint tool in expert group seminars. All the cards will be put on the table randomly for experts to pick and categorize. We take pictures and record the process of the seminar in this stage to record the discussion about the categorization of every phase and to be used for the subsequent arrangement and analysis. The overall seminar time planning is shown as table 4.

Table 3. Basic information of 6 designers for every design category

Code	Gender	Age	Experiences (years)	Design fields
W1	Female	32	6	Kitchen utensil design
L1	Male	40	10	Furniture design
L2	Male	45	11	Transportation design
A1	Male	32	6	Computer equipment design
W2	Male	45	12	Communication equipment design
M1	Male	50	17	Industrial machinery and equipment design

Table 4. The agenda table of expert group seminar

Time	Activity contents	Place
13:30~14:00	Experts check in	Asia University, the veranda of A110 meeting room
14:00~14:30	Brief interdiction and explanation of plans	Asia University A110 meeting room
14:30~17:30	Expert group seminar	Asia University A110 meeting room
17:30	End	

3.3. The Survey of Images Expect Vocabulary Corresponding to Lifestyle Ethnic Groups

The research target of the third phase is to find the Semantic Differentials corresponding to an ethnic lifestyle group, and the adopted method is a questionnaire survey. The design of the questionnaire uses the three dimensions of semantic space proposed by Osgood as the rating scale and adopts the Likert Scale (shown as table 5). The questionnaire survey adopts random convenience sampling and conducts surveys through online and paper questionnaires, and 35 subjects are expected to be invited

for each lifestyle to fill in the questionnaire, so there are 105 total subjects participating in the experimental survey. At the end, the survey results will find out the images expect vocabulary corresponding to lifestyle ethnic groups through profile matching.

Table 5. The questionnaire survey table of the image semantic space for lifestyle ethnic groups (only listing)

Semantic space Category	Evaluation					
	5	4	3	2	1	
LOHAS	Good	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bad
	Happy	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Unhappy
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Potency					
	5	4	3	2	1	
	Strong	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Weak
	Soft	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hard
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Activity					
	5	4	3	2	1	
	Active	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Passive
Nervous	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Relaxed	
.....	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

4. Research Results

Based on the experimental survey of three phases, the research survey results are described as follows.

4.1. The Commonly Used Semantic Differentials in Design

Table 6. The commonly used Semantic Differential in design

Semantic Differential				
practical(9)	beautiful(2)	versatile(2)	brief(3)	streamlined(3)
simple(6)	complex(2)	amazing(2)	gorgeous(3)	kind(2)
handy(5)	popular(2)	concise(2)	durable(3)	delicate(2)
concise(4)	pretty(2)	cute(2)	innovative(3)	organic(2)
luxurious(4)	fashionable(2)	bright(2)	generous(2)	humanistic(2)
technological(4)	interesting(2)	abstract(2)	colorful(2)	convenient(3)
safe(4)				

Explanation: the number in () means the frequency.

Through the results of literature review and an open-ended questionnaire survey, the overall number of collected Semantic Differentials was 160, and there were 101 total words after we integrated the same words. Next, through the statistic of frequency, we adopted the words whose frequency was 2 or above to be the commonly used Semantic Differential in design. Among them, "practical" has the most frequency with 9, "simple" has the frequency of 6, "handy" has the frequency of 5, "concise", "luxurious",

“technological”, and “safe” have the frequency of 4, and “brief”, “gorgeous”, “durable”, “innovative”, “convenient”, “streamlined”, and others have the frequency of 3, and all of the above are shown as table 6. After we collected and organized, there were 31 total commonly used Semantic Differentials in design.

4.2. The Commonly Used Semantic Differentials in Lifestyle Ethnic Groups for All Kinds of Products

According to the consumer ethnic lifestyle group research of E-ICP, there are 7 total categories of lifestyle ethnic groups and the E-ICP database is used to provide the characteristics of lifestyle ethnic groups respectively for 6 experts as the reference. The first step of the experimental survey is to ask experts and scholars to choose the commonly used lifestyle ethnic groups in design, and calculate the chosen lifestyle ethnic groups and sort them. The top 3 groups in the sorting are the ethnic lifestyle group subjects in this research, which are LOHAS, the technology group, and texture group. The survey results are shown in table 7.

Table 7. The results of choosing lifestyle ethnic groups

Sorting	Semantic Differential	Frequency	Percentage
1	LOHAS	6	100%
2	Technology group	6	100%
3	Texture group	5	83.33%
4	Popular group	4	66.67%
5	Healthy group	4	66.67%
6	Adult group	3	50%
7	Investment group	3	50%
8	Middle-aged and elderly group	3	50%
9	Adolescent group	2	33.33%

The second step is to conduct the extraction of the images expect vocabulary of the lifestyle ethnic groups respectively from the 31 obtained Semantic Differentials in the first phase and the 3 lifestyle ethnic groups surveyed in the previous step, and the results of the discussion of the experts and bachelors are shown as table 8. There are 8 total images expect vocabulary items for LOHAS, and there are 8 total expected images expect vocabulary items for the technology group, and there are 9 total images expect vocabulary items for the texture group.

Table 8. The results of experts choosing the expected images expect vocabulary for every ethnic lifestyle group

Categories of lifestyle ethnic groups	Expected image vocabulary
LOHAS	practical, simple, humanistic, kind, concise, organic, safe, convenient
Technology group	beautiful, versatile, streamline, innovative, popular, fashionable, concise, technological
Texture group	beautiful, gorgeous, fashionable, popular, luxurious, generous, delicate, colorful, abstract

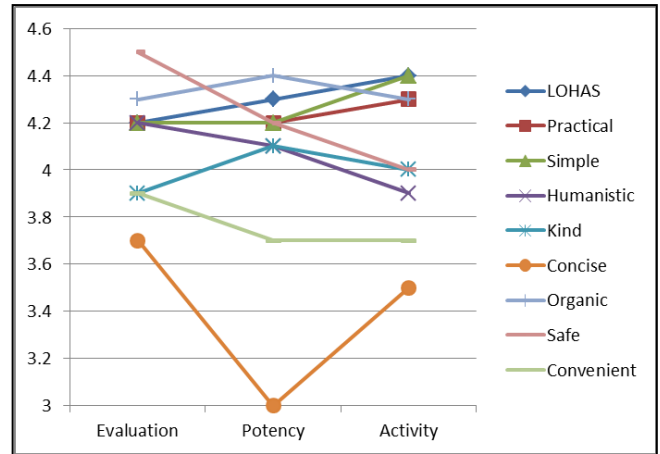


Figure 3. The profile figure of expected images expect vocabulary for LOHAS

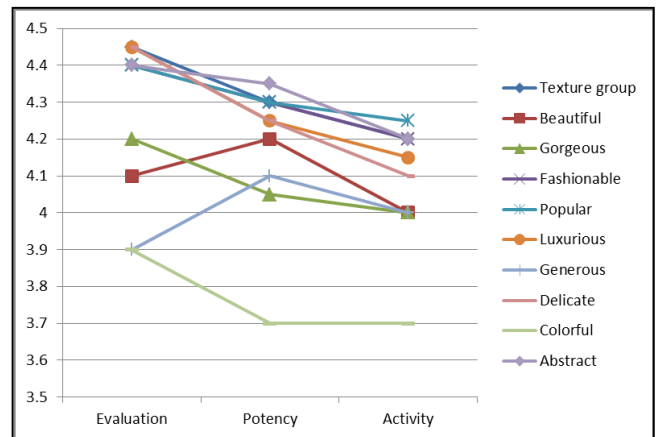


Figure 4. The profile figure of expected images expect vocabulary for the technology lifestyle ethnic groups

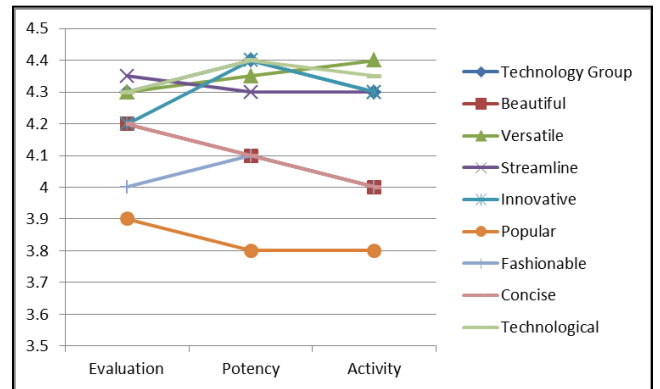


Figure 5. The profile figure of the images expect vocabulary for the texture ethnic lifestyle group

4.3. The Images Expect Vocabulary Corresponds to Lifestyle Ethnic Groups

According to the questionnaire survey of different lifestyle and Semantic Differentials, we first add up the score of the semantic space of every lifestyle, and get the questionnaire survey results of the subjects of the three kinds of semantic space. Next, we get the average score and standard deviation of every semantic image scale, and we

can draw up a profile figure based on the average score. From the figure, we can know that the expected images expect vocabulary closest to the lifestyles of LOHAS is practical, simple, and organic (as figure 3).

The expected images expect vocabulary closest to the lifestyles of the technology group is technological, versatile, streamlined, and innovative, which are shown in figure 4. The images expect vocabulary closest to the lifestyles of texture ethnic lifestyle group is fashionable, popular, luxurious, and abstract, which are shown as figure 5.

5. Conclusions

Through the experimental survey results for three phases, we can obtain the following definite conclusion for the extraction of the Semantic Differentials for the three different lifestyle ethnic groups (LOHAS, technology group, and texture group).

1. Different lifestyle ethnic groups actually have different corresponding Semantic Differentials.
2. Not all of the commonly used Semantic Differentials on design are suitable for different ethnic lifestyle consumption groups, so the extraction of Semantic Differentials should actually be put into more detailed divisions.
3. The Semantic Differentials decided by different designers on different lifestyle ethnic groups might lead to the distortion of the extraction of designing elements because the deciding process is too rough.
4. The cognition of the subjects to the images of lifestyle ethnic groups can be expressed by a three-dimensional space composed of three factors, which are evaluation, potency, and activity. The highest score in the evaluation factor of LOHAS is "safe", while the highest score in the evaluation factor of the technology group is "streamlined", and the highest score in the evaluation factor of texture group is "delicate" and "luxurious." The highest score in the potency factor of LOHAS is "organic", while the highest score in the potency factor of the technology group is "technological" and "innovative", and the highest score in the potency factor of the texture group is "abstract." The highest score in the activity factor of LOHAS is "simple", while the highest score in the activity factor of the technology group is "versatile", and the highest score in the activity factor of the texture group is "popular."

From the research above, we definitely found out the expected images expect vocabulary for the three lifestyle ethnic groups, and we have the following suggestions on improving the conducted extraction of Semantic Differentials, which takes lifestyle ethnic groups as the main perspective.

1. So far, the phase of design exploration and product development has largely adopted lifestyle ethnic

groups as the referring basis of research, development, and orientation of the products on the market, so we suggest that any design or marketing planning related to Semantic Differentials should further conduct the preparatory research of images expect vocabulary for lifestyle ethnic groups in order to make sure the products are close to the demands of consumers.

2. The results of the preliminary stage of this research might be used to conduct the extraction of an images expect vocabulary for other lifestyle ethnic groups and enhance the effects and accuracy of Semantic Differentials one by one.
3. The research of the relevance among different lifestyle ethnic groups, Semantic Differentials, and images can be conducted subsequently, and the e-platform can be constructed to be a tool able to operate an image billboard during design.

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