2021-1159 IJOI
https://www.ijoi-online.org/

International Journal of Organizational Innovation

INTERVENERS' EXPERIENCE ANALYSIS IN AMBIENT MEDIA DESIGN

Yung Chin Tsao
Professor, The Graduate Institute of Design Science,
Tatung University, Taiwan, R.O.C.
tsao@ttu.edu.tw

Jing Jing Wang
The Graduate Institute of Design Science,
Tatung University, Taipei 104, Taiwan.
Department of Engineering and Art,
Beijing Union University, Beijing 100101, P.R. China
105143915@qq.com

Abstract

Ambient media design methods emphasize the relationship between design and the surrounding environment. Users of ambient media design can be divided into two categories-viewers and interveners. The purpose of the study is to explore the experience of the interveners in different ambient media designs. First, 16 cases of ambient media design were collected and the interaction modes of the interveners were analyzed. Then experimenters were selected to rate the similarity of the above design samples. The average scores were analyzed with the cluster analysis method and two groups were obtain "Ambient media design requires interveners' operant behavior to produce interactive effects" (G1) and "Ambient media design requires interveners' reluctant behavior to produce interactive effects" (G2). Next, 6 pairs of contradictory autonomy describing emotion and experience were pick out to test on the subjects, the contradictory antonym were evaluated and analyzed by principal component analysis to explore the constituent factors of the interveners' feelings. Finally, based on the subsidiary concept of the interaction of ambient media, the corresponding

design method could be acquired and the ambient media cases were used as the examples of testing. The results showed that The ambient media design cases of "Ambient media design requires interveners' Autonomous behavior to produce interactive effects"(G1-1) brings surprise and concise feelings to the intervention. and "Ambient media design requires interveners' instinctive behavior to produce interactive effects" (G1-2) makes the interveners feel surprised but more complicated compared to the former. The ambient media design cases of "Ambient media design requires interveners' reluctant behavior to produce interactive effects" (G2) will make some interveners feel boring. Studying the interveners experiences and characteristics of design techniques of ambient media designs in the above categories can provide designers with a basis for finding such ideas, and enhance the richness, interest and value of the design.

Keywords: ambient media, interveners' experience, interactive, design image

Introduction

Ambient media originated from advertising design, which initially means that non-traditional media conveys products or services outside the home environment, emphasizing the relationship between design and the surrounding environment. The application of ambient media design methods in public space and product design can more efficiently and vividly transmit information and attract users' attention. According to Marketing Week, 80% of consumers hope to have the opportunity to interact with products, such as touching, smelling or listening, when purchasing products. Therefore, consumers can obtain the message that the design itself wants to convey through different sensory experiences when using or being in ambient media design, and at the same time satisfy their personal emotional preferences. Besides, different interaction modes can increase the fun in the process of operation and perception.

Overview

The Ambient media design method places special emphasis on the relationship between the characteristics of users or products and the surrounding environment. Ambient media creativity is to discover new space, find an excellent combination between product features and media, and make full use of the relevant static or dynamic elements in the space environment or products to show unique visual effects and communication effects. From the perspective of whether users are required to be an ele-

ment in the design, ambient media design can be divided into two categories. One type requires only users as viewers, and the other type requires some other users as interveners to complete the ambient media design together in addition to viewers. The research subject is the part of ambient media design that requires user intervention. The subject of this study is the part of ambient media design that requires user participation when conveying information. This study intended to understand how "Ambient media" combines the surrounding elements to express ideas and ways to transmit information. The purpose of the study is to explore the experience of the interveners in different ambient media designs.

Research Method

In the previous research, the author divided the ambient media designs into two categories from the perspective of interactive methods-requiring user intervention and without user intervention. The object of this research is mainly the interactive methods and design methods of ambient media design cases that require user intervention. Therefore, after studying a wide range of advertising and product cases related to existing ambient media designs, The parts that require user intervention were selected and the corresponding methods of the interactive mode were analyzed. Then the cases with high similarity and irrelevance were excluded. On this basis, 16 advertising and commodity cases were sorted out as the required test cases of the interactive concept of ambient media. This paper briefly analyzed the relationship between "conveying information" and "environment" of their expression methods for each sample.

	S1	S2	S3	S4
Name	Plastic hospital advertisement	Public service advertisement	Watch advertisement	Hip Hop music
Sample				
Message	After plastic surgery, the bridge of the nose is taller and straighter.	Graffiti will be brought to justice.	Experience the feeling of wearing this watch	Together with the background pictures, the people waiting for the bus form the image of the black music singer.

Interaction method and effect	Drinking from a paper cup seems to have a different nose.	The passenger in front sits on the bus seat as if his hands are handcuffed.	A passenger is holding the bus pull ring as if wearing a watch.	Sitting in the bus stop waiting for the bus, just like wearing a black singer hairstyle .
	S5	S6	S7	S8
Name	Nike advertisement	Underwear advertisement	Bar door handle design	Product atlas design
Sample				
Message	Stop sitting, move and run!	Passengers waiting for the bus can't resist "Victoria's Secret" on the wall behind them.	Come in and have a drink!	This knife can cut apples as thin as paper.
Interaction method and effect	Remove the seat of the park bench so that people cannot sit down, advocate people to go for a run.	The seat facing the poster is in the opposite direction to the other seats, as if the persons sitting on it were attracted by the photo and turned the seat around.	Make the handle of the wine glass a doorknob so that when you open the door and come in, it is like holding up a glass of beer.	When turning the pages of the book, from the side of the book, the apple looks like it was cut into thin slices.
	S9	S10	S11	S12
Name	Jeans advertisement	Gymnasium advertisement	Colgate advertisement	Flea-removing article for pet
Sample				
Message	"Wearing these very sexy jeans will always attract people!"	Get up from your chair and go to the gym!	Don't forget to brush your teeth after eating delicious popsicles!	Pedestrians on "huge" dogs are like hateful lice. Use Frontline to get rid of them.

Interaction method and effect	When you bend over and look at the small letters under the arrow in the poster, you will lift your butt and appear in an "attractive" posture.	Once you sit on the seat of the bus stop, your weight will appear on the electronic sign next to it.	The toothbrush advertisement was printed on the popsicle stick, and I happened to see it after eating the popsicle.	People walking on the ground floor of a department store where small posters are printed are fleas on dogs.
	S13	S14	S15	S16
Name	Public service advertisement	Fiat Auto advertisement	Public service advertisement	Bread advertisement
Sample				
Message	Concerned about autistic children.	Fiat car panoramic skylight.	Do not drive after drinking.	The toast is so big and soft.
Interaction method and effect	Picking up the handbag is like holding the hand of the girl in the picture.	The aircraft portholes match the image of the car body, and when the sunshade is lifted, it is like opening the car sunroof.	The car graphic is printed on the lid of the wine bottle. When the metal bottle cap is opened with a corkscrew, the car graphic deforms along with the bottle cap.	The high jumper jumped over the railing and landed on the toast-shaped mat, which was very soft and safe.

To understand the communication mode of ambient media, the similarity evaluation was carried out on the design methods and communication mode of the above 16 test cases in this stage. Cluster analysis method was used on the average results and the conceptual structure of communication mode ambient media (Figure1) was summarized. The subjects were 10 college teachers and students with design background, including 4 males and 6 females.

According to Figure 1, from the perspective of interveners' interactive ways, ambient media techniques can be divided into "Ambient media design requires interveners' operant behavior to produce interactive effects" (G1) and "Ambient media design requires

interveners' reluctant behavior to produce interactive effects" (G2). "Ambient media design requires interveners' operant behavior to produce interactive effects"(G1) could be further divided into "Ambient media design requires interveners' Autonomous behavior to produce interactive effects" (G1-1) which means the combination with the interveners' action will produce a certain familiar image on "user's behavior" and "situation" to convey design idea and "Ambient media design requires interveners' instinctive behavior to produce interactive effects" (G1-2) which means the combination with the interveners' certain posture or state even without the aware of them to convey design idea. For example, in Case 8, the action of turning pages is used as a metaphor for cutting apples with a fruit knife. With the help of the intervener's action and association, the idea of the ambient media design conveys. In Case 13, it feels like holding the hand of an autistic child to walk with her when the intervener instinctively picks up the handbag. This action is a necessary element of the complete ambient media design.

"Ambient media design requires interveners' reluctant behavior to produce interactive effects" (G2) means that when interveners are in the ambient media design in this environment or become one of the elements of the design that constitutes the complete design expression, such as Cases 2, 9 and 10. In Case 2, the passengers sitting in the front seat are handcuffed behind the back in the eyes of the pas-

sengers in the back seat, which constitutes a picture of violating the regulations and being punished. In Case 9, interveners are required to “sacrifice” some of their privacy when integrating into the media design of the environment. If a certain part of the body is exposed or weight information is disclosed, especially Case 10, if users are tired and need to use the seat, they will have to let their weight be posted on the electronic bulletin board beside the seat. The corresponding characteristics and cases of each group are listed in table 2.

Table 2. Corresponding Characteristics And Cases Of Each Group

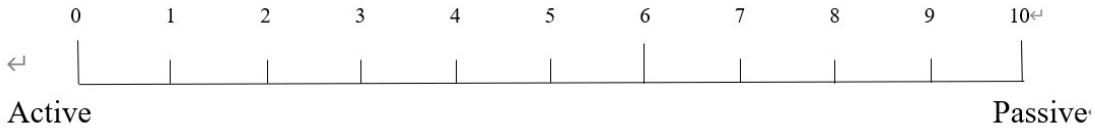
Group	"Ambient media design requires interveners’ operant behavior to produce interactive effects"(G1)		(G2)
	G1-1	G1-2	
Name	Requires interveners’ Autonomous behavior to produce interactive effects	Requires interveners’ instinctive behavior to produce interactive effects	Requires interveners’ reluctant behavior to produce interactive effects"
Characteristics	The combination with the interveners’ action will produce a certain familiar image on “user’s behavior” and “situation” to convey design idea	The combination with the interveners’ certain posture or state even without the aware of them to convey design idea.	When interveners are in the ambient media design in this environment or become one of the elements of the design that constitutes the complete design expression
Cases	S1,S3,S7,S13,S14,S16	S4,S5,S6,S8,S11,S12,S15	S2,S9,S10

Next, the modifying words of ambient media were set. The image words used by the test were selected in two stages. In the first stage, an open questionnaire survey was conducted on the emotional modifying words of ambient media advertisements, and 10 modifying words of ambient media feelings were collected, which were matched with modifying words of their relative meanings to form word pairs. In the second stage, the subjects were asked to choose the right word pair to describe the ambient media image through a questionnaire survey. There were 22 subjects, all of whom were students majoring in industrial design at Beijing Union University (10 males; 12 women), aged between 19 and 24. The results of the survey are shown in

Table 2, among which the top 6 pairs of words selected as follows:

1. Active and passive/
2. Innovative and stereotyped/
3. Surprise and ordinary/
4. Desired and rejected/
5. Clear and vague/
6. Variable and fixed.

First, the subjects were asked to watch the ambient media design cases from Sample 1 to Sample 16 one by one. The test had no time limit. They can watch and imagine the situation in the ambient media design as the experienced repeatedly until they understand the meaning of the design scheme and the experience mode. Then, the subjects expressed the feeling of the situation or usage state of the design scheme. Six pairs of test terms were evaluated. The evaluation took the word “active-passive” as an example. If the expression situation or usage state of the design scheme was considered to be very active, the score is 0; if it is very passive, the score is 10, and the feeling between the two is properly scored, as shown in Figure 2.



In this stage, the average scores of all subjects were analyzed by principal component analysis to explore the main factors of the above 16 ambient media design cases and the feelings of the experienced. The results are shown in Table 3.

Since the cumulative explanation rate of the two principal components is 75.506%, and the eigenvalues are both above 1, the second principal component is extracted for analysis.

As Table 4 shows, the first principal component can be interpreted as a "surprise-boring" factor by the representative images as "surprise-ordinary" and "innovative-old-fashioned" factors of higher principal component load; the second principal component can be interpreted as a " concise-complicated "

Table 3. Total Variances

Group	Initial eigenvalue			Retrieve sum of squares load			Cyclic sum of squares load		
	Total	% of variation	Accumulated %	Total	% of variation	Accumulated %	Total	% of variation	Accumulated %
1	2.921	48.691	48.691	2.921	48.691	48.691	2.711	45.188	45.188
2	1.609	26.815	75.506	1.609	26.815	75.506	1.819	30.318	75.506
3	.698	11.639	87.145						
4	.427	7.119	94.264						
5	.226	3.762	98.026						
6	.118	1.974	100.000						

Table 4. Principal Component Analysis Results

	Group	
	1	2
C. Surprise -ordinary	.918	
B. Innovative - stereotyped	.889	-.139
D. Desired - rejected	.811.	.451
A. Active - passive	590	.516
F. Variable-fixed	-.199	.863
E. Clear - vague	.183	.764

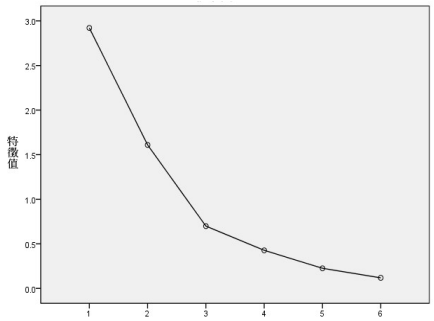
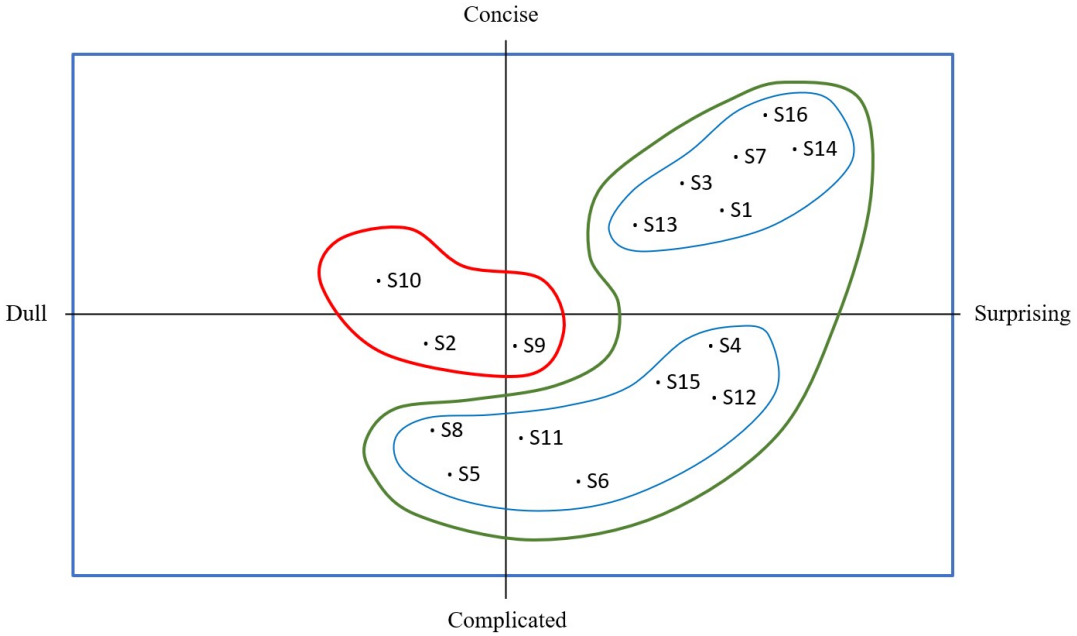


Figure 3 Steep Slope Map



factor by the representative images as " clear -vague" and "variable-fixed" factors of higher principal component load. 16 samples of ambient media design cases listed in the article are measured on the image scale. The measurement results are shown in Figure 4. Finally, the design methods are extracted as follows.

Generally speaking, "Ambient media design requires interveners' operant behavior to produce interactive effects"(G1) brings users a "surprising" design image. Specifically, the images of "Ambient media design requires interveners' Autonomous behavior to produce interactive effects" (G1-1) are "surprising" and "concise". The feature of the design techniques of this group is

that the interveners' some postures are required to produce amazing visual combination effects. The evolution of interaction is from instinct level to behavior level. The images of "Ambient media design requires interveners' instinctive behavior to produce interactive effects" (G1-2) are "surprising" and "concise" comparing with G1-2. The feature of the design techniques of this group is that, the position of the intervener is vacant. The interveners participates either unconsciously or spontaneously, and the continuous action of the participating process has a certain meaning.

The image of G2 group "Ambient media design requires interveners' reluctant behavior to produce interactive effects" tends to be "boring", and the way of interaction is instinctive interaction. The common feature of design techniques is to use the instinctive reaction of the intervener in participating in the ambient media design situation to constitute a situation.

Conclusions

The purpose of the study is to explore the experience of the interveners in different ambient media designs. This kind of ambient media is composed of two groups of cases, "Ambient media design requires interveners' operant behavior to produce interactive effects" (G1)and "Ambient media design requires interveners' reluctant behavior to produce interactive effects" (G2). Further , G1 contains two sub-group-"Ambient media design requires interveners' Autonomous behavior to produce interactive effects"(G1-1) and "Ambient media design requires interveners' instinctive behavior to produce interactive effects"(G1-2). Perform image test on the design samples and get the following main results: The main factors that constitute the interactive image of ambient media are: "surprise-boring" and " concise- complicated ". The design methods are extracted as follows: The feature of the design techniques of the "Ambient media design requires interveners' autonomous behavior to produce interactive effects" group (G1-1) is that the interveners' some postures are required to produce amazing visual combination effects. The evolution of interaction is from instinct level to behavior level. The concept of this group is to use the user's instinctive actions to extend a certain artistic conception. The feature of the design techniques of the "Ambient media design requires interveners' instinctive behavior to produce interactive effects" group (G1-2) is that , the position of the intervener is vacant. The interveners participates either unconsciously or spontaneously, and the continuous action of the participating process has a certain meaning. The metaphorical information can also be received by the viewers. Because the operation mode of this kind of ambient media designs must be metaphorical or spatial association context, it brings users a "complicated" feeling.

However, the ambient media design cases of "Ambient media design requires interveners' reluctant behavior to produce interactive effects" (G2) will make some interveners feel boring, the way of interaction is instinctive interaction. This design technique uses the instinctive reaction of the intervener when participat-

ing in the ambient media situation to form a certain situation. To achieve this effect, interveners are often teased, or at the expense of personal privacy.

References

Norman, Donald A., (2005), Emotional Design: Why We Love (or Hate) Everyday Things.

Norman, D. (2002). Emotion & design: attractive things work better, interactions, v. 9 n. 4, July http://blog.yam.com/tinkaichie/article/25 418153)

Li, G.T., (2010). Image of Ambient Media in Products' Usage. Master's Thesis, Graduate School of Industrial Design, Tatung University.

Yao, T.M., (2011). The Effect of Feedback for Products' Usage on the Image of Ambient Media. Master's Thesis, Graduate School of Industrial Design, Tatung University.

Hung, C.W., (2012). Package Design and Image of Applying the Interactivity of Ambient Media. Master's Thesis, Graduate School of Industrial Design, Tatung University.

Tseng, R.M., (2011). Investigating the Emotional Interaction between Ambient Media and Audience, Department of Industrial Design, National Kaohsiung Normal University. Journal of Design, 16(3).

Abdul Razzaq, S., et al. (2009). Cutting through the clutter? A field experiment measuring behavioural responses to an ambient form of advertising. Proceedings of Australian and New Zealand Marketing Academy Conference.

Ssu-Yu Chen (2017) The Impact of Ambient Media Performance on Consumers' Decision-A Case Study of Leisure Sport Advertising。

Stewart, A.X, Muthmann, A. Sanguinetti G. (2014). Single-trial classification of EEG in a visual object task using ICA and machine learning. Journal of neuroscience methods.