

Affective Responses toward Personalized Blog Interfaces Design

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Abstract

Bloggers, the author of blogs, place great emphasis on the visual interface of their blogs and both usability and affective factors are important considerations for a blog to be successful. This study uses the Semantic Differential technique to evaluate affective responses and then used Multidimensional Scaling algorithms PREFMAP to explore main dimensions influencing users' affective responses to personalized blog interfaces, and the corresponding design factors that may be used to manipulate them. Finally, this study first defines the three dimensions of an affective perceptual space, each with their corresponding design factors and affective responses. This study also discusses design rules for blog interface bloggers and developers.

Keywords: *blog, affective response, multidimensional scaling (MDS), PREFMAP algorithm*

1. Introduction

The popularity of the Internet also enables people to have a space where they can easily maintain as many blogs as they wish, and where they can freely express themselves. For this reason, blogs have become a new form of social network. The American IT blog columnist Gilmer (2004) points out that 1.0 was old or traditional media, 2.0 is what people normally call new or cross-media, and 3.0 is We Media, or personal media, of which blogs are a trend. The blog is an author-centered communication medium that emphasizes absorbing information and sharing it, and representing the blogger's value system and convictions. Research has found that the two most important considerations when choosing a blog platform are (1) which platform their friends use, and (2) good interface design (InsightXplorer, 2011). Blogs were originally mainly textual, but later increasingly emphasized visual modes of expression; bloggers too attempted to find a way to express themselves within the constraints of the blog form (Fullwood, Sheehan, & Nicholls, 2009; Zheng, 2005). Moreover, Herring, Scheidt, Bonus, & Wright (2004) found that bloggers want their blogs to be individualistic and reflect the self-identity, and for these reasons it is important, therefore, to examine blog interfaces from an emotional perspective.

Nowadays blog platforms offer a choice of ready-designed interface layout templates, thus lowering the technological and cost threshold for setting up personal blogs. However, little research has been undertaken analyzing users' experience when using blog interfaces; furthermore, blog platforms offer layout template choices but choosing many templates can be very time-consuming for bloggers. Moreover many blogs still use the same blog templates, and lack distinctiveness. Therefore how to make a blog interface easy to use, individualistic, and that stands out, are issues strongly emphasized by both bloggers and developers.

The objectives of this paper are: (1) to analyze what the important dimensions influencing affective responses to blog interfaces are; (2) to explore the correspondence between users' affective responses and the design factors of blog interfaces.

2. Literature Review

2.1. Blog

Du and Wagner (2006) studied popular and successful blogs, and developed a model for successful blogs that encompassed content value, technology value and social value. They emphasized technological, content and social influences, and believed that enhancement of technological factors assists in improving content and social value. The technological layer includes services offered via blog platforms, aspects of which include interface usability and visual design. Thus if one wishes to raise the quality of an entire blog, technological as well as social and content considerations are absolutely vital. Alternatively, Hsu and Lin (2008) approach blog research from three aspects: technology, knowledge exchange and social influence. They found that, aside from ease of use that had already been emphasized in past research, enjoyment, including feelings of joy, happiness, and satisfaction, was also a factor that markedly influences users' attitudes to participating in a blog, thus affirming the importance of users' affective responses.

Blogs differ in type according to the differing goals of bloggers and the scale of the blog. Hsu and Lin (2008) divided blogs into two main categories: personal interest blogs, including diaries and opinions; and specialist forums, such as economic polls and surveys or reports about using new technologies. The object of this current research is personal blogs, as with personal blogs there is more emphasis on the arrangement and editing of visual layout, and layout changeability, whereas group or forum-type blogs tend to emphasize clarity of information layout, and are normally visually less creative.

Blog layouts can be divided into 3 main areas: the title area, the article area, and the function area. To illustrate, an actual blog is shown in Figure1: 1. The title area can be

mainly divided into the main heading (1-1) and the function list (1-2). Normally a blog's title area is situated at the top of the page and orientated horizontally; 2. the article area includes the date (2-1), title (2-2), and article content (2-3), and related information (2-4); 3. the function area mainly includes personal files (3-1), article types (3-2) and latest articles (3-3), is located either on the left or right hand side of the page, and is normally narrower than the article area.



Figure 1. Structure of blog layout (source: this study)

Bloggers regard blogs as their own publically accessible virtual space, and so besides textual content, also utilize arrangements of visual features such as images and color to make that space unique. Lin (2006) explored personal blog design from the blogger's perspective, indicating that, apart from currently preferring simple and clear interface designs, bloggers also require their blogs to have a personalized look. This emphasis on personalization means that bloggers wish their blogs to have their own unique personality and style, which they set about expressing chiefly through visual layout design. This means that blog personalization is very closely related to visual expression; for example, in order to attract users, bloggers put a great deal of thought into decorating their blogs, and a good visual design can increase users' sense of enjoyment when browsing a blog. The goal of this research is to understand exactly what kind of feelings the different visual features of blog interfaces give users. It also seeks to understand which main design factors can be manipulated to arouse users' affective responses.

2.2 Research into Users' Affective Responses to Interfaces

As blogs are themselves a form of webpage, past research relating to webpages can also be used to discuss and compare blog interface designs. Researchers suggested two approaches to identifying high-level concepts of website design which may be used as focuses for improving user experience (Noam Tractinsky, Cokhavi, Kirschenbaum, & Sharfi, 2006; van Schaik & Ling, 2008). First, an affective approach focuses on users' processing of the attributes of webpages (Hassenzahl, 2004; Lavie & Tractinsky, 2004; Pandir & Knight, 2006; Schenkman & Jönsson, 2000). Second, a design-based approach focuses on how to find the quantitative relationship between design factors and affective responses to webpages (Kim, Lee, & Choi, 2003; Park, Choi, & Kim, 2004).

Tending towards the affective approach, Schenkman and Jönsson (2000) carried out research into aesthetic appeal and user preferences in webpages. Using multidimensional scaling (MDS) and factor analysis, this study summarized seven property vectors for webpage preferences: complexity, legibility, order, beauty, meaningfulness, comprehension, and overall impression. Hassenzahl (2004) discussed how overall quality or 'goodness' of an interactive interface is formed. Lavie & Tractinsky (2004) used factor analysis to investigate the perceived visual aesthetics of websites, and found that factors influencing user perception include classical aesthetics and expressive aesthetics. Pandir and Knight (2006) found that among aesthetic preferences for webpages there was a correlation and consistency between complexity, pleasure, and interest, and evaluations of the aesthetics of webpages. Of these, pleasure and interest were relatively subjective aesthetic evaluations, while complexity was an objective, non-aesthetic evaluation.

The above research shows that the feeling created by a website is of considerable importance. Social networking blogs emphasize communication between people more than ordinary websites; however there is little research into the relationship between visual expression and user emotion in blogs. This study will use a design-based approach to explore the theme of blog interface design.

3. Research Method

3.1. Experiment Design and Relevant techniques

This research first used cluster analysis to select a representative sample of blog interfaces. An Semantic Differential (SD) survey into affective response of subjects was undertaken, and the data analyzed using MDS, in order to understand the relationship between visual features of blog interfaces and affective responses. A brief introduction to the characteristics of the MDS algorithms PREFMAP follows.

MDS analysis is a set of statistical techniques used to explore potential relationships in human perceptions of a stimulus and generate a perceptual space. In this study, subjective affective response data is transposed onto a geometrical space to allow easier interpretation. MDS represents objects as points in a Euclidean space so that the perceived distances between points can reflect dissimilarity between objects. For practical reasons, the number of dimensions of the projected space is usually kept as low as possible.

3.2. Sample

3.2.1. Blog Sample Selection

The stimuli of the experiment in this research are blogs. Initially, a wide-ranging sample group of 315 blogs were collected from Taiwan's top 5 most popular blog platforms (in terms of number of users), i.e. Wretch, Yahoo!Kimo, PIXNET, Xuite, and Yam blogs (InsightXplorer, 2010). In order to reduce the burden on the subjects in the experiment, one representative blog from each group was chosen, producing a final sample of 18 blogs.

3.2.2. Selection of Affective Adjective Pairs

Researchers first searched for affective adjectives suitable for describing images of blog interfaces in books and research relating to webpage or blog interface, initially obtaining 200 such words. The 8 experts who had selected the blog samples then discussed these words, arranging them in to pairs, eliminating those that were too similar, until finally 60 pairs remained. These words were written on small cards, and then the same 30 subjects from the blog selection stage were asked to divide them into groups according to similarity. Then hierarchical cluster analysis (Ward's method) was used to produce a cluster dendrogram of the 60 affective adjective pairs. The 8 experts discussed the results of the cluster analysis and decided by majority decision to choose a division of 11 groups. They then selected a single adjective pair from each group that best represented that group. The final selection is 11 adjective pairs. The aim of this screening process was to reduce the number of criteria of the SD method, so that subjects did not spend an excessive amount of time carrying out the evaluations.

4. Results and Discussion

The 127 subjects evaluated each of the 18 blogs on a 9-point semantic differential scale for each of the 11 adjective pairs. PREFMAP analysis plots the structure of affective response data collected from the subjects onto the similarity space previously obtained from Hsu & Chou (2010)'s research. This allows affective response and similarity structures to be simultaneously displayed in the same space. In the PC-MDS software, the PREFMAP can be divided into four stages (Phases I-IV). Phase IV's Vector Mode shows the adjective pairs as vectors, and the projection of each stimulus point along each vector represents the degree to which that stimulus point possesses the qualities of that adjective pair.

The 3-dimensional space ($R^2=0.79$) obtained using PREFMAP's Vector Mode is now split into two separate maps, showing Dimension 1 against Dimension 2 (Figure 2a) and Dimension 1 against Dimension 3 (Figure 2b) respectively, so that the perceptual space can be interpreted easier. In the perceptual space, each adjective pair is represented by a direction vector, and therefore has 3 direction cosine values according to the angles it forms with the 3 dimensions, given in Table 1. Because $\cos 0^\circ = +1$, $\cos 90^\circ = 0$, $\cos 180^\circ = -1$, the direction cosines can be seen as the distance of each adjective pair vector from the 3 dimension axes; the closer the value is to 1, the closer the adjective direction vector approaches the positive direction of the dimension; the closer the value is to -1, the closer it approaches the negative direction of the dimension; and when the value is zero, it is perpendicular to that dimension, which would indicate that no relationship exists between the adjective pair and that particular dimension. The results show that Lively-Sedate (A10) and Creative-Conservative (A4) are the two adjective pairs closest to Dimension 1, and so this dimension can be named "Liveliness and Creativity." The three pairs closest to Dimension 2 are Elegant-Rugged (A7), Masculine-Feminine (A9), and Classic-Modern (A1), and so we can call this dimension "Refinement." Finally, there is only one adjective pair close to Dimension 3, and that is Humanistic-Technical (A3), so it seems reasonable to name this dimension "Technicality."

The direction cosines

<i>Dimension 1</i>	<i>Dimension 2</i>	<i>Dimension 3</i>
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<i>affective response vectors</i>		<i>Liveliness & Creativity</i>	<i>Refinement</i>	<i>Technicality</i>
A1	Classic-modern	-0.31	-0.91	0.29
A2	Imaginative-realistic	0.39	-0.89	-0.24
A3	Humanistic-technical	-0.01	-0.41	0.91
A4	Creative-conservative	0.82	0.36	-0.45
A5	simple-complex	-0.45	0.81	0.36
A6	Oppressive-relaxing	0.63	0.77	-0.14
A7	Elegant-rugged	-0.08	-0.99	0.11
A8	rich-monotonous	0.72	-0.54	-0.43
A9	masculine-feminine	-0.10	0.95	-0.29
A1 0	Lively-sedate	1.00	0.04	0.08
A1 1	Liked-disliked	-0.55	-0.42	-0.72

Table 1. The direction cosines of affective response vectors

The results from PREFMAP show each adjective pair's relationship to the blogs in the perceptual space. If we project the co-ordinates of each blog on to the individual adjective pair vectors, the co-ordinates of the projected values obtained reveal the degree to which each blog possesses the qualities of those adjective pairs, and for any given adjective pair we can also obtain the order of degree to which the blogs possess the qualities of that adjective pair. Taking the Lively-Sedate vector, for example, the first three blogs from the Lively end are S1, S8, and S18. S1 and S8 feature hand-drawn illustrations that are youthful in flavor; S18 uses a large quantity of grass green and long curved lines to give the impression of plant life, and all 3 blogs are lively in feeling.

Now, examining the perceptual space created by PREFMAP we can see the visual features of the blogs distributed along each direction of the axes. First, looking along Dimension 1 (Figure 2a), i.e. Liveliness and Creativity, it can be observed that the blog samples at one end incorporate mainly hand-drawn illustrations, but moving along the axis the images used become increasingly realistic, until at the other end of the axis the blogs use mainly naturalistic photographs. Thus the factor of image type not only plays an important role in how creative or conservative users perceive a blog interface to be, but is also a significant factor for bloggers who wish to design distinctive blogs that express their own style to consider. If hand-drawn type illustrations are used, this creates a lively and creative affective response, as for example in blog S8, which uses cartoon techniques, and S1, which is like Kuso manga in style. Conversely, if realistic photographs are used, the feeling produced is sedate and conservative, as for example the plant photographs in blogs S7 and S12, and the scenic photographs of blog S5. This information enables bloggers to choose a type of images appropriate to the style they wish to express.

The blogs distributed in the top half of Dimension 2 (Figure 2a), Refinement, e.g. S3, S16, and S17, have a more refined, classic feel to them. The layouts of these blogs tend to use more decorative images, and are divided into blocks of a variety of sizes. Those that fall into the bottom half, e.g. S10, S11, and S13, are less refined, more rugged and modern in style, featuring simpler images and laid out in more grid-like pattern. It can be inferred from this that the way the layout of a blog interface is arranged influences its overall style. Examining trends in visual features, it can also be seen that those at the top feature a warmer palette, and that the colors used gradually become cooler the further down towards the bottom of the dimension the blog is placed. One can also observe that more feminine-style blogs appear at the top and those of a more masculine style at the

bottom. The use of warmer colors can be used to create a more feminine style, while a cooler color palette may be used to create a more masculine one. It is clear then that color is another design factor that may be manipulated to produce different affective responses in users according to this dimension.

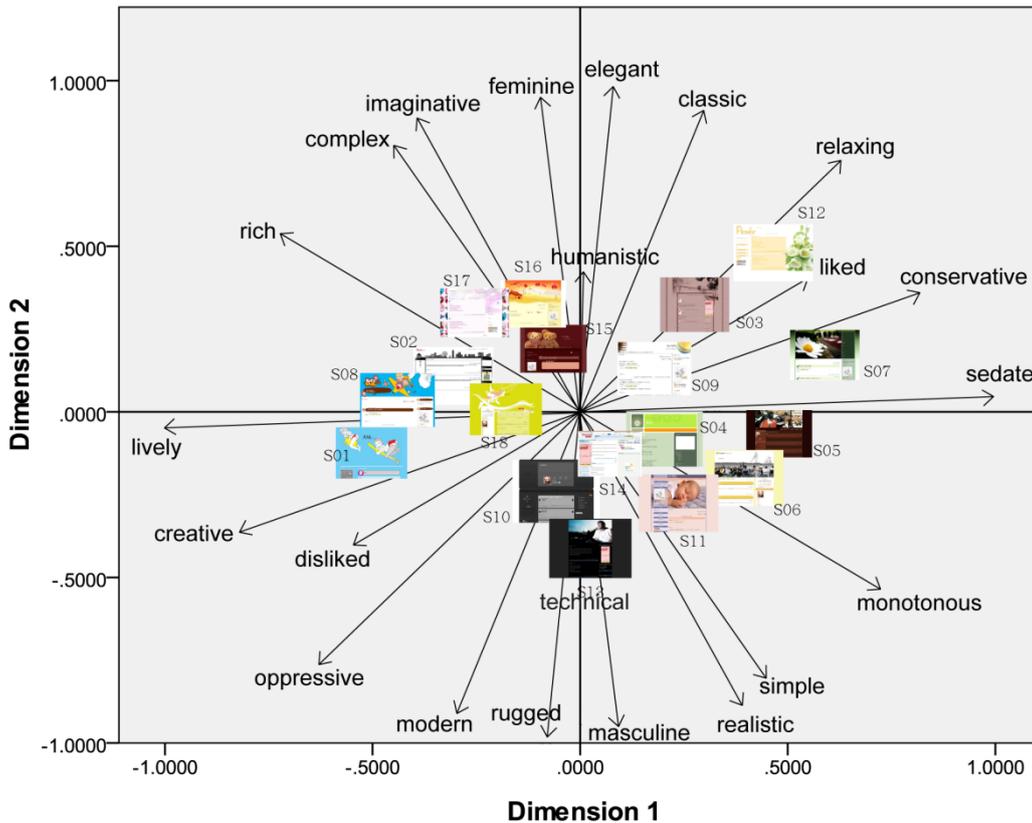


Figure 2a. Dimensions 1 and 2 of the affective perceptual space produced by the PREFMAP analysis

Dimension 3 was labelled Technicality (Figure 2b). Blogs that are text-heavy, with a more technical feel are distributed near the top of this axis, and become progressively more image-heavy, humanistic in style nearer the bottom. Blogs whose layout is dominated by text, such as S4 and S14, feel more technical, whereas blogs such as S11 and S15, which have a higher proportion of images compared to text, have a more humanistic feeling. This demonstrates that text-image ratio is an important factor influencing users' perceptions of the degree of technicality in style of a blog. Schenkman et al. (2000) carried out a similarity study on a sample of 13 webpages, and also found that text-image ratio was an important dimension (factor) upon which subjects in the study judged webpage similarity and preference; in that study they did not go further to suggest the emotional effect on users produced by text-image ratio's, and the findings of the present study further indicate that this affective response to the relative proportions of text and images in a blog is an important factor that may be used to design blog interfaces that are humanistic/technical to varying degrees. Besides this, selection of the theme of image content also appears to influence this dimension; the use of images with, for example, more organic, human themes and those with more mechanistic, architectural each have fairly predictable influence on whether a blog has a humanistic or technical feeling.

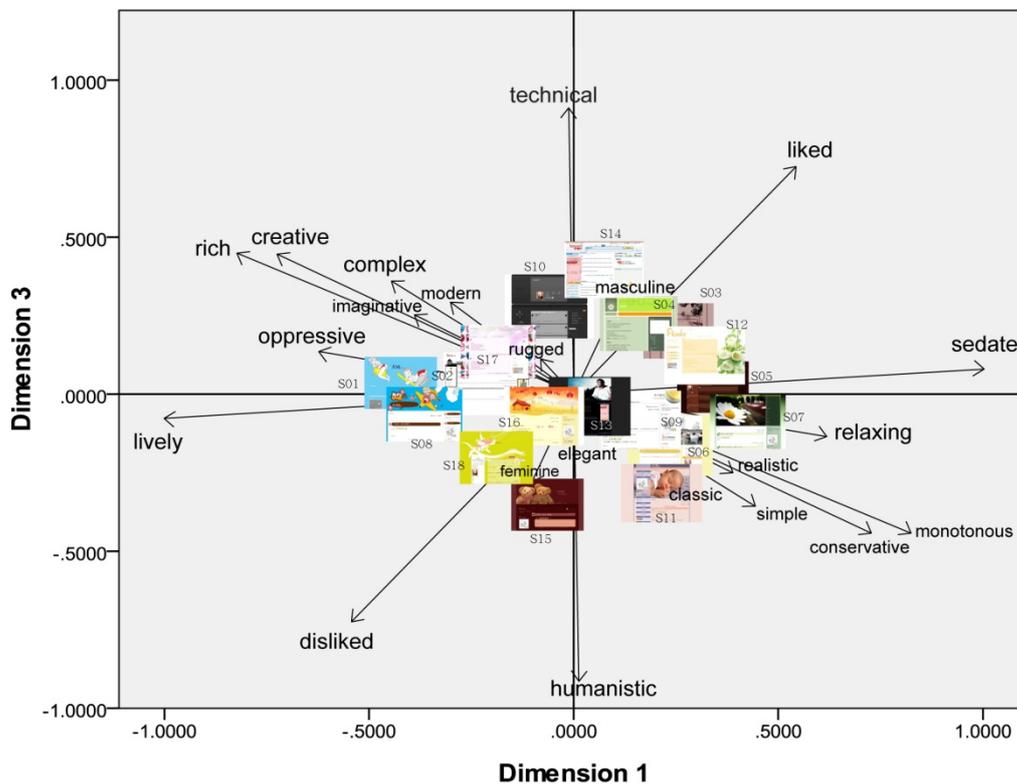


Figure 2b. Dimensions 1 and 3 of the affective perceptual space produced by the PREFMAP analysis

A glance at the correlation coefficients between each pair of affective adjectives as shown in the last column of table 1 tell us that Liked-Disliked, a preferential, evaluative adjective pair, has a moderate correlation with Oppressive-Relaxing ($r=-0.48, p<0.05$) indicating that users like comfortable-feeling blogs. It is obvious that blog users often spend much time reading the content, so they tend to like blog interfaces that feel relaxing and not oppressive. The other adjective pairs all have no significant correlation, which may perhaps be something to do with the fact that the majority of the 11 adjective pairs selected in this study not being evaluative in nature, showing that these adjective pairs can all be useful reference points for constructing blog styles.

5. Conclusions and Suggestions

User experience is a key factor in attracting users to return to a website (Fang & Salvendy, 2003) and will stimulate a positive affective response in users, improving their mood and overall evaluation of the website (Tractinsky, Shoval-Katz, & Ikar, 2000). Much past research found that design factors, including color, imagery, shape, and images, all influence users' affective responses to a website, and also their desire to continue using a website (Cyr, Bonanni, Bowes, & Ilsever, 2005; Everard & Galletta, 2006; Fornell & Larcker, 1981; Rousseau, Sitkin, Burt, & Camerer, 1998). These indicate that appropriately using design factors can hugely affect the success of an interface. Many studies point out that a successful blog needs an interface that is easy and enjoyable to use and reflects the blogger's self-identity (Du & Wagner, 2006; Fullwood et al., 2009; Hsu & Lin, 2008; InsightXplorer, 2010, 2011). This study went further to clearly identify the relationship between specific affective responses and the corresponding design factors that influence them. In addition, we used a perceptual space to aid visual comparison of the different visual features of blog interfaces. The results of this study

could bring even greater benefits for practical design or development of ready-designed layout templates.

This research used the SD method and MDS analysis to construct an affective perceptual space, labeling the 3 axes 'Liveliness & Creativity,' 'Refinement,' and 'Technicality.' This space enabled visualization of users' affective responses to each blog interface. Examining how the visual features of the sample blogs are distributed along the dimension axes of the space allowed more objective identification of the important design factors that may be used to manipulate those visual features. We could also predict which affective responses will be aroused by manipulating a given design factor. The results show that the design factors corresponding to the three dimensions of the affective perceptual space were 'Type of Images,' 'Layout Style & Color,' and 'Text-Image Ratio,' respectively. Designers can refer to this perceptual space when designing an interface, and manipulate these three key design factors to create a variety of different moods.

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