Online Advertising as a New Story: Effects of User-Driven Photo Advertisement in Social Media

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Abstract. Mobile devices have infiltrated into our lives. The constant connectivity via wireless technology led to a growth of social media. It is different from traditional media in that it provides interactive communication without restriction of time and place. Marketing industry is struggling to increase its presence by advertising in this new media environment. This paper presents a new advertising model based on user-generated content. This model was theoretically approached by the psychological mechanisms. We show its effectiveness using our experiments that measure users' attention levels and advertisement recall rates. The proposed model can be potentially applied to online advertisements in diverse platforms and devices.

Keywords: Social media, online advertising, self-referential effect, mobile advertising, interaction design.

1 Introduction

In recent years, mobile device market and social media platform have influenced each other's growth concurrently. The most popular social media, Facebook, has 604 million mobile users among 1.01 billion monthly users. It is anticipated that the rate of growth in mobile usage will exceed growth of personal computer usage in the foreseeable future [1]. Mobile devices have given us an always-on connection to social information and it has connected people in unprecedented ways. The new way of connection makes it possible to have personal experience shared to social media space easily via wireless communication.

Despite the efforts of the marketing industry to increase advertising in mobile social media, massive advertisements inherently have adverse effects on user experience. The more advertisements appear on a social media space, the more indifferent to them the user's response becomes due to the phenomenon called 'Banner Blindness' where users consciously or subconsciously ignore advertisements while browsing internet [2]. This paper presents a new user experience design that may possibly overcome this phenomenon. It is developed based on the psychological mechanisms such as the brand-logo effect, self-enhancement and self-referential

effect and thus takes user's behavior in social media into consideration. Our experimental studies show that the new proposed design draws user's attention and enhanced advertisement retrieval rates.

2   Related Works

2.1   Online Advertising on Mobile

The appearance of smartphone changed the perception of mobile usage radically during a few years. Touch screen interaction liberated finger tap to browse directly with contents. As mobile space became viable market opportunity, business begins to advertise on it.   Since SMS marketing, mobile advertising has been regarded as a tool of easy target advertisement, personalized content and interactive communication [3].   Different from early mobile marketing, the smartphone has made advertising more diverse than before. Among them, display advertising became the most pervasive form in these days. The banner ads started to insert into small mobile screen as like desktop web browser. The popularity of mobile banner ads has been steadily increasing and the advertisers in the US spent $1.8 billion on mobile display advertising in 2012, more than triple the amount spent in 2011 [4]. Google has combined its online advertising platform into Admob service with search ads, display ads, and ads for mobile apps. It provides relevant banner advertisement according to mobile app contents. The previous study verified that both the banner advertisement and obtrusive information presentation style has a positive influence on the advertising effectiveness in desktop webpage context [5]. However, the mobile environment has inherently problem of the small screen to deliver immersive advertising experience with rich media as same as desktop environment. Moreover, there is a significant positive correlation between perceived interactivity and attitude toward the mobile advertisement, while current banner ads provide limited interactivity [6]. Therefore, the perceived interactivity with immersive engaging experience should be considered when designing new online advertising format in mobile environment beyond the static banners.

2.2   Social Advertising

Social advertising is regarded as more valuable given their rich social context. The most well-known social network service, Facebook and Twitter have provided ad format helping brands become a part of the usual content experience. These social advertising must balance the trade-off between eye-catching presence and user experience. Facebook's newsfeed ads and Twitter's promoted products maintain their service design without static banner ads. For example, sponsored stories are the social advertising occurred from friends about engaging with brands. This advertising is aligned with effectiveness that previous study discovered which social tie strength and endorser expertise are meaningful factors of advertising effectiveness such as purchase intention [7]. Similarly, social cues presentation in word-of-mouth advertising significantly increases in advertising performance as well [8]. However, the mobile

social advertising design is still limited only to displaying ads. According to research about advertising value perceptions among females on Facebook and television, they assessed ad value by the basis of entertainment and information on both environments [9]. However, current displaying ads design has a limitation to convey attractive entertainment and information. To overcome, the social advertising has been trying a targeted ad form via users' interest or personal data from their expressive behavior in social context. According to previous works, consumers may be willing to tolerate contextually targeted ads more than other ads because targeted ads potentially provide information [10].   However, the opinions of behavioral targeting of online advertising remain controversial. Users dislike having data collected about their browsing behavior and expressed dislike of highly visible ads in surveys [11]. In this vein, the social media advertising is necessary to be designed innovative way providing rich experience with entertainment and information without highly visibility and private obtrusiveness.

3   User-Driven Advertising Model

3.1   Psychological Mechanism

The design of user-driven advertising model was developed theoretically based on the psychological mechanisms. The previous research discovered users' underlying motivations in online behavior. We applied them practically to design enhanced mobile social media advertising model.

Self-referential Effect. The self-referential effect is a rich and powerful cognitive encoding process. As an aspect of the human information-processing system, the self appears to function as a super ordinate schema that is deeply involved in the processing, interpretation, and memory of personal information [12]. Moreover, there is the link between social cognition and self-referential thought. The recent study discovered that social cognition about the mental state of another person increase self-referential effect with deeply cognitive processing as well [13]. We assumed the social cognition primes self-referential effect when people use social media filled with friends' contents. We proactively made use of this effect to design integration of advertisement with friends' contents.

Self-enhancement. The users' message-sharing behaviors are motivated by the need for self-enhancement. Specifically, when consumers perceive an online advertisement as consistent with their self-concept or how they see themselves, they are more likely to share that message with others to express self-identity [14]. We considered this finding as an important design trigger to make users drive sharing advertisement with their contents as the way of expressing their self-concept.

Brand-logo Effect. The brand-logo works as the visual brand-identity cue for people. The recent study demonstrated brand-logo as emotionally and cognitively tagged information which is an influential factor biasing decision making and learning.

The brand-logos heavily guided selection within a task that is strongly driven by emotional factors [15]. In this context, we used the emotionality of brands as a guiding cue to link users' contents and advertisement and draw attention. In the proposed model, the brand-logo is marked in users' contents when it combines with advertisement.

3.2   Design of User-Driven Advertising

We propose user-driven advertising model, which includes advertising process of production and consumption in the matrix of online social media relationships. We considered self-enhancement, self-referential effect and brand-logo effect in designing every stage of this model. We have used photo contents as the core contents to combine with advertisement because of its popularity while transmitting personal experience effectively. The key element of proposed design is that advertisement is contextually well woven with the photo by users. It consists of advertisements, social media platform, users combining ads with photo and exposure to another user by click. First, the advertisements are uploaded to social media platform. Users select the advertisement to share with friends when they upload photo. While social media combines advertisement and photo content, a representative logo is attached to selected photo for distinguishing it from common photos. Another user click logo marked photo and it changes into selected advertisement.

The self-enhancement desire is working at the first stage of selecting photo and advertisement. The desire may be fulfilled when they express self-concept through selecting photos and advertisement. The brand-logo and self-referential effect are aligned with advertising effectiveness. The photo marked with brand logo arouses emotionality and attention about brands. The advertisement combined with friend's photo is experienced in process of social cognition with self-referential effect. Its emotional and cognitive encoding is possible to enhance users' emotionality and cognition (Figure 1).
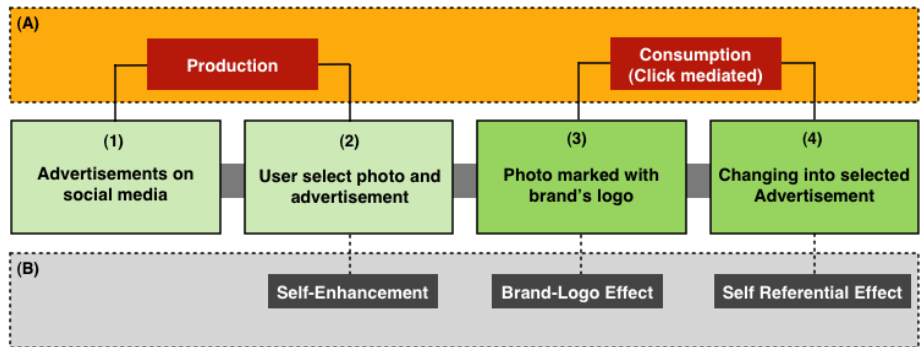

Fig. 1. User-driven advertising process: (A) external and (B) internal mechanism

4   Evaluation of Proposed Model

4.1   Prototype Development

We developed test pages of proposed model applied to Facebook pages. We decided Facebook as a test social media platform because of its universal familiarity. To assess its effectiveness, we created four Facebook mobile test pages of current and new advertising interface divided by famous and anonymous brand condition. The former one was consists of current Facebook ads interface and the latter one was inserted with proposed design, ad combined with photo, on friends' newsfeed posts. We provided the form of 'recommended posts' and 'pages you may like' as current Facebook advertising interface. We inserted eight advertisements among friends' daily posts in test pages. The experiments explored a possibility that whether the advertising effectiveness occurs or not dependent on advertising interface and brand familiarity. Figure 2 shows example advertisements on each test pages. The new design provides click-through interaction as mentioned before.

Fig. 2. Test pages by advertising interface and brand familiarity conditions

4.2   Experimental Design

To experiment new advertisement's interface effectiveness, we created two assumptions. The brand logo on photos would arouse users' engagement because of its emotionality. The other assumption was that users memorize advertisements more effectively in the proposed interface than current one because advertisements are consumed in social context with self-referential effect. Therefore, we measured user's attention by eye-tracker and retrieval performance via survey after use of test page. The brand logo effect was also assessed by questionnaire whether it causes affirmative attitude. One hundred three students, average between 19 to 35 years ($M=24.6$, $SD=3.46$), participated in this study and equally divided into four groups. The experiment was conducted as between-subject design by two dependent variables.

Table 1. Experimenatl design and the number of participants

	Famous brand	Anonymous brand	Total
Current design	25	26	51
New design	27	25	52
Total	52	51	103

5   Result

5.1   Brand Logo Effect

To assess brand-logo effect, we investigated by eye-tracker study and survey research. We presented current Facebook ads image and new proposed design, brand logo marked users' photo to two students. We have averaged results of their eyeball tracking about attention to the images and pointed as shown in Fig 3. The result proved that the brand logo on users' photo also has drawn attention as much as current Facebook ads.
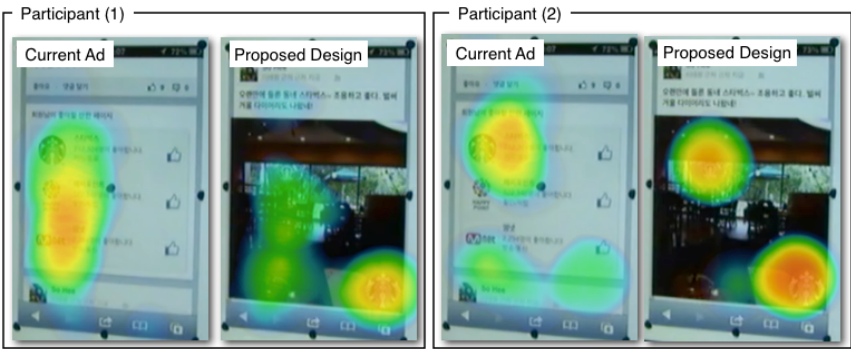

Fig. 3. Eye-tracking results of two participants

However, there was a possibility that the attention caused from obtrusive disturbing engagement of brand logo. Moreover, participants have not watched the mixture of photo and brand logo before and it could be occurred from instant response. We investigated further that this attention caused from negative or positive attitude. The participants provided with new interface of famous and anonymous brand asked to answer how much they agree about brand logo on users' photo with shown adjectives (useful, interesting, irritating and disturbing) by seven-scale agree to disagree measure. We averaged useful and meaningful adjectives as positive factor and the negative factor averaged by irritating and disturbing adjectives.

The result from twenty-seven participants' data in famous brand condition proved the positive of brand logo (*M=5.20, SD=1.12*) is significantly higher than negative factor (*M=2.64, SD=1.28*): t (52) = 7.79, $p<.05$. In anonymous brand condition, the response data from twenty-five participants demonstrated that brand logo on users' photo is regarded as more positive (*M=4.90, SD=1.07*) than negative (*M=2.70, SD=1.41*): t (25) = 6.20, $p<.05$.
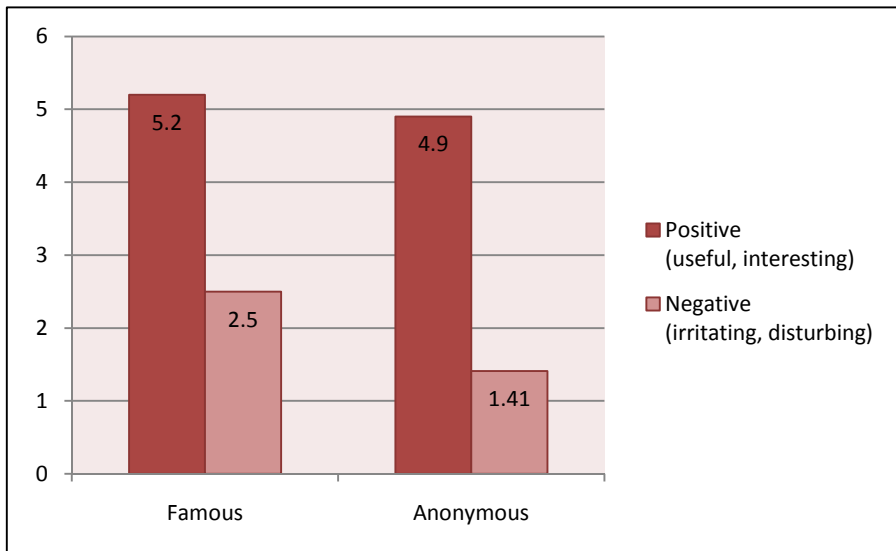

Fig. 4. Positive and negative appraisal of brand logo on user's photo

5.2   Retrieval Performance

The four group participants were asked to use Facebook mobile example pages according to their condition. After they experienced test page, we offered blank paper to recall advertisements they've seen. The result supported our assumption that the new advertising interface leads to memorize more ads than current interface because of its self-referential effect caused by social cognition. The retrieval mean difference was significantly valuable between new interface and current interface in both famous

and anonymous brand conditions. In famous brand condition, participants memorize more ads in the new advertising interface ($M=4.22, SD=1.31$) than current Facebook ads interface ($M=1.56, SD=1.12$): $t(50) = -7.84, p<.05$. The new user-created advertising interface ($M=2.96, SD=1.09$) caused significantly more retrievals than current one ($M=1.92, SD=1.29$) in anonymous brand condition as well: $t(49) = -3.08, p<.05$. (Figure 3)

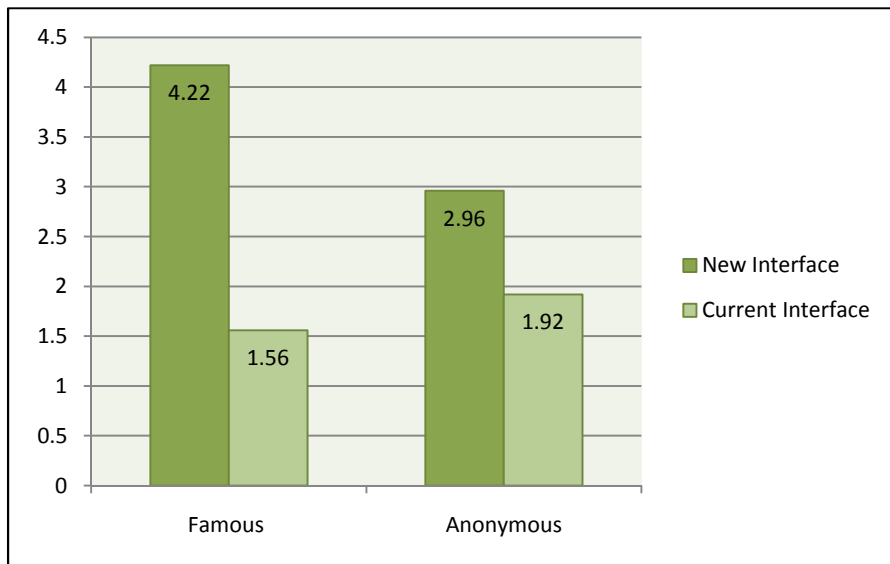**Fig. 5.** Retrieval of advertisements in new interface and current interface

6   Conclusion

The new design has been developed to engage users with advertisement more naturally in mobile social media than current banner ads. People spend more and more time with mobile devices, and the issue of effective advertising interface has become growingly important in this time of radical technology change. It is well accepted that the new mobile advertising interface design can be made more effective by taking user's behavior mechanisms into account. We have designed a user-driven advertising model and show its effectiveness using our experimental studies. The brand logos combined with photos arouse attention and result in positive attitude. The new design leads to improved advertising retrieval performance as well. This model has a possibility to provide more entertainment and informational advertisements through interactive clicks than static banner ads, by placing ads in user's photo space. On the other hand, our research has the limitation that it has not yet explored self-enhancement desire to share ads. The experiments presented in this paper are also restricted to users' instant responses after using the new design and the eye-tracker study has provided the static images on desktop browser. In our future research, we

will look over user's attitude and attention changes over time with repetitive exposure of the new advertising design. It would be interesting to see if the brand logo on user's photo can keep drawing attention in the same way as in the first time. We also intend to explore what motivates users to share advertisement that is combined with photos. The further study will investigate the effectiveness of our proposed model on various social media platforms and devices such as Twitter or Pinterest, and tablet or PC.

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