

A Diary Study of Smart Phone Notification System For College Students

Ji Wang*, Qingyao Zhang, Qinqing Gong[†], SeungHee Lee*, §

*Kansei,Behavioral and Brain Sciences

Graduate School of Comprehensive Human Sciences

University of Tsukuba, Ibaraki, Japan, 305 0005

Email: wangji@kansei.tsukuba.ac. seungheekansei@gmail.com

†School of Psychology

Shaanxi Normal University, Xi'an, China, 710062

Email: qingyaozhang@outlook.com purivy0430@sina.com

Abstract—Smart phone can support a variety of functions in people's daily life. Notification is one of the basic core function of smart phone user experience. This research explored the college students' behaviors when they deal with the notification system of smart phone. In order to know the behaviors of user, this study conducted a diary study method to record the information about notification users received from the smart phone. Before the one week diary study, a pre-experiment interview was conducted, the results of interview shown that they have a negative evaluation to receive notifications (disruptive). Hierarchical linear model analyses on the diary contents suggested that the current task types had significant influence on the college students' evaluation on notification disruptive. The evaluation on the importance of notification content can predict user's evaluate on the disruptive of notification content.

Keywords—notification system; smart phone; dairy study; user experience.

I. INTRODUCTION

Smart phones have become an integral part of college life, current smart phone can support a variety of functions. Notification is one of the basic core functions of smart phone. Notification is used to drive the users attention to the content of a notification message and remind user about something. As the media for user to communicate with the outside world, it is difficult to measure the importance of notification. However, many users feel pressure for the notification system. Previous studies have shown a core problem with notifications was that users tend to drop their current task to check the notification instead [1]. In the work context, this can be explained by the fact that notifications interrupt workers. Information workers find it difficult to return to a previous task after having been interrupted by a notification. They report higher subjective workloads when receiving notifications during phases of focused work. However, previous studies have also shown that people value notifications. Those studies also suggested that notifications vary in different levels of importance [2]. A diary study was conducted to explore the extent to what kinds of notifications are needed by college students. Dairy method have high ecological value as they carried out in the users real environments [3]. It helps the researchers to get in-depth understanding of users day to day jobs and environment diary study can be used which involves participants reporting their

activities over a specific period of time in their normal daily lives addressing the when, the what and the how. This study will use diary method, which will record daily events of the user deal with the notifications accurately. It helps to understand how the notification usage changes over the time (Compared to a traditional in lab usability study where this study typically gather information on firstly time usage of a system or product) and the kinds, frequency of notification and so on.

The structure of the paper is as follows: Section I introduces the essence of the smart phone and notification system. In section II the method of the experiment is introduced. Section III reports the result of the diary study on the smart phone notification system. In Section IV, the analysis and discussion of the diary study results are presented. Finally, in Section V, the conclusions of this research are laid out.

II. METHOD

A. The Participants

Fourteen participants from Shannxi Normal University took part in this experiment , 8 female and 6 male, with the age distribution 18-24 years old ($M = 20$, $SD = 1.96$). 2 out of 14 participants (one female and one male) interrupted the diary collected during the study,so this study totally collected twelve participants' data.

B. Device

All the mobile phone (provided by participants) used in this experiment with the version above Android OS 4.3 or iOS 8.1). Participants were required to install Smartisan Notes (A notetaking app.User can add picture in the notes and download this APP in Apple Store or Google Play for free). Participants should set on their phone notifications system in the mode that the notifications come and it can show on the lock screen.

C. Procedure

Pre-experiment interview was conducted to know the background information about participants smart phone notification interview questions included :

Q1: How many app installed on your phone?

Q2: These types of app (social network/ video and image/education/payment/online shopping service), how many of each kind app and how you set the notification systems of these app ?

Q3: Share a recent experience about the Notification affect (disturb) your study or work ?

Dairy study:

Contents of dairy collection as shown in Figure 1

Date	Time	Current task	Location	Source of information	Notification context	Grading Importance disruptive 1 2 3 4 5 1 2 3 4 5
2016.9.7	08:13	Reading book	Library	WeChat	News feeds	
	09:25	Running	Playground	QQ	Group chatting	
	13:16	Sleeping	Room	Phone	Package	

Figure 1. The Example of Dairy Content

Each participants took the records of dairy content for one week [2].

III. RESULT

In this experiment, pre-experiment interview were conducted for 14 college students, they installed 11 to 42 applications ($M = 23.64$, $SD = 9.39$) in their smart phone. These applications can receive notifications when connected network. Based on the previous survey of applications types, we classify the applications into: social networks, video and images education, entertainment, payment and life services.

We collected a total 739 notification messages information from 12 participants in one week. Coding scheme: gender codes are: 0 = female, 1 = male; grade codes are: 1 = freshman, 2 = sophomore, 3 = junior students, 4 = senior students.

There are 21 categories in current task, 9 categories in location and 21 categories in notification sources. Based on the real life situation (classification of apple store applications), we coded the current task again. To facilitate the analysis of the hierarchical linear model, we did the dummy coding for current task, location, notification sources. Current task was coded as 4 dummy variables location was coded as 3 dummy variables, the notification sources was coded as 4 dummy variables.

To test the the relationship between notification sources and the importance of the notification (short for importance), we built the multilevel random slopes model in this study. Results showed that the mean value at level 2 of dummy variables entertainment, life service, and education achieved significant difference ($P < 0.05$), indicated that the source of the notification message affects participants evaluation about the importance and urgency of a specific message. Specifically, compared with the notification from the social networks, the notification from entertainment and eduction

applications were considered less important, life services application notifications were more important. Additionally, there was no significant difference between the importance of notification from social networks and life services applications. The result of primary data was shown in Figure 2. It shows the average rating of disruptive at different times of the whole day. Morning and afternoon periods were more disruptive than other periods, because it was the study time for college students.

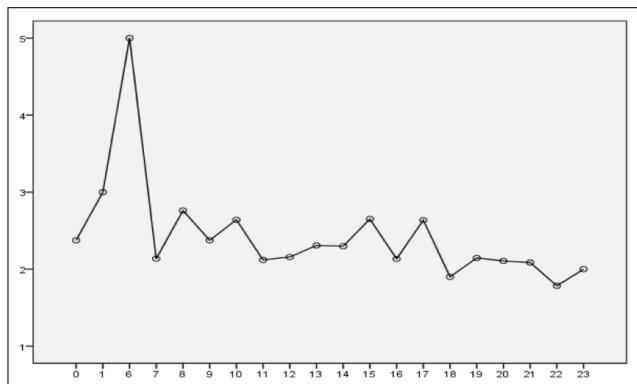


Figure 2. The Average Rating of Disruptive at Different Times

IV. DISCUSSION

From the dairy content, we found that college students interact with their smart phone all the time in their daily life. They basically put attention to the notifications when they came. This finding is consistent with previous study[1], even though the importance of those notification content were not high. Hierarchical linear model analyses was conducted on the diary contents, the results shown the current task types had significant influence on the college students evaluation on notification disruptive. When college students focused on current tasks, especially those tasks correlated with study, the interrupt caused by dealing with notification make college students rated the disruptive of notification in a high score. This study also found he change in on the importance of notification content can predict users evaluate on the disruptive of notification content. The results of this study can give suggestion to the college students to deal with the notification system. For instance, when students are carrying out study or work task they can choose to set the notifications system to Do not disturb or Mute mode, it will reduce the times of notification interrupt the current task.

V. CONCLUSION

This research carried out a dairy study to explore college students evaluations about the notifications of their smart phones. It suggests a new usage model for smart phone manufacturers to develop in their devices for college students. The notification sources were categorized into four categories, they were, listed in descending order of importance, life services, social networks, entertainment and education. Additionally, the current activity affects participants' evaluation about the

interference of the notifications. Specifically, when they were studying or working, they considered the notifications are more noisy. Due to the limitation of sample size, a wider range of participants—including office staff, programmers and other brain-workers, could yield an opportunity to more broadly generalize the results.

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