Users' Emotional Experiences during Interaction with Information Products: A Diary Study

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Abstract. Emotional experience is a very important aspect of users' interaction with information products. Previous research has agreed that emotion is an important ingredient which could enhance the interaction between human and computer. In this paper, we explored users' emotional experience in relationships with other factors such as product types, product features, interaction results, and user behaviors. We analyzed 162 dairy entries from 36 users in 2 weeks. Results show that: (1) users recorded more negative emotions than positive emotions; (2) mobile apps were related to more positive emotions while desktop software was related to more negative emotions; (3) there is no significant correlation between user behaviors and emotions. The results provide exploratory understanding of the relationships between emotional experience and other factors. We propose that users' expectation might play a key role in this process.

Keywords: Emotional Experience, Interaction Process, Diary Study, Information Products.

1 Introduction and related work

When users interact with information products, they experience a wide range of emotions. They might feel annoyed by constantly popping up windows, while they might be pleased when they successfully complete a task. Emotions (or feelings) - encompass physiological, affective, and behavioral components in an extensive cognitive processing with needs, goals, and concerns of an individual [1] – are constantly engaged while users interact with products [2]. These emotions add meaning and richness to virtually all human experience. Reeves and Nass [3] suggested that on-screen objects and events have the potential to activate emotional responses in an HCI context.

People now get used to different types of interaction products such as mobile application, desktop software and website, and terminal devices. Emotion categories have direct impacts on action readiness [4]. It is proposed that emotions originate in two broad action tendencies—to approach or to withdraw [5]. Prior research has studied the relationship between emotional experience and other factors, such as product properties [6] and user behaviors [7]. Jordan et al. suggested that approaches to affective design need to consider different types of product [8]. Thus, it is important to explore the relationships among emotion, product types and features, user behaviors, and interaction

results.

In this poster, we conducted a semi-structured dairy study in which participants were asked to record their interaction process while using different types of information products. Participants were asked to report their emotions, behaviors and interaction results. We analyzed the emotional experience in relationship with other factors involved such as product types and features, user behaviors, and interaction results to understand what factors are related to emotional experiences.

2   Methods

2.1   Data Collection

We recruited 36 sophomore students (13 male, 23 female) from two sessions of an information management curriculum, and 7 of them were international or exchange students. The students were asked to record their interaction process from any kinds of information products (mobile phones, desktops or terminal devices) in a text form over a two-week period. Table 1 shows an example record from one of our participants.

Table 1. An example record

4705	Face-book	Watched and commented on friend's posts. Looked at subscribed website and account posts. Chatted with friends in HK and USA. Played online games (Tetris) with friends. It was hard to use in Mainland China, VPN was needed When playing the free online game, the pop up advertisement was annoying and made you want to stop playing the game. The interface was pleasant and easy to use.

We received a total of 162 records (4.5 per participant, ranged from 1 to 10): 53 of mobile application, 59 of desktop software and website, and 50 of terminal devices.

2.2   Data Analysis

The coding scheme is shown in Figure 1. The emotion category was based on Cowie et al.'s typology [5]. The rest of the coding scheme was constructed using a ground theory approach. Nvivo 11 was used to conduct our contents analysis. Fifty records (30% of all the data) was randomly picked and cross-coded by two coders independently. We used kappa coefficient to evaluate our agreement. The overall kappa is 0.62. We then asked the third person to join the discussion and resolved the disagreement in coding, updated the coding scheme, and completed the rest of the coding.

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A Emotion			B Feature		C Result & Feedback	
A1 Engage	A101 Interested	A102 Excited	**B1 Category**	B11 Mobile app	**C1 Result**	C11 Success
A103 Pleased	A104 Confident	A105 Amused	B12 Computer software & web		C12 Failed	C13 Stuck
A106 Proud	A107 Calm	A108 Content	B13 Terminal - Devices		C14 No feedback	C15 Unclear
A2 Unpredictable	A201 Worried	A202 Surprised	**B2 Attribute**	B21 Capacity	C16 Pop-up	C17 Content Error
A203 Relived			B22 Size	B23 Weight	C18 Misoperation	C19 Interrupted
A3 Withdraw	A301 Anxious	A302 Bored	B24 Aesthetic	B25 Speed	**C2 User Feedback**	C21 Re-interact
A303 Dispointed	A304 Guilty	A305 Despairing	B26 Strength	B27 Complexity	C22 Wait	C23 Ignore
A306 Hurt	A307 Sad	A308 Ashamed	B28 Sound		C24 Overcome	C25 Giveup
A309 Disgust	A310 Annoyed	A311 Embarrassed			C26 Delete & Discard	
A312 Afraid	A313 Frustrated	A314 Miserable				
A315 Tired						

Fig. 1. Coding scheme

3 Findings

3.1 Emotion Experiences

60% of coded emotions are "withdraw", such as annoyed, disappointed and frustrated. Most negative emotions were caused by unsuccessful interaction results, such as waiting for respond or re-interaction. User27 mentioned that, "I felt annoyed, because a lot of pop-up windows come out when using a bike-sharing app and I must manually close all of them." Only 35% are coded as "engage". The most frequent emotions are shown in Figure2.
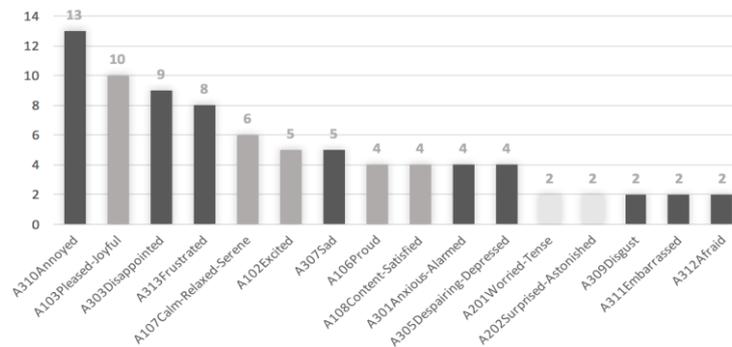

Fig. 2. The most frequent emotions

For product features, aesthetic (58, 46%), complexity (36, 29%) and speed (23, 18%) were most frequently mentioned. No prominent differences have been found between interaction results and emotional experience. Meanwhile, user feedbacks are generally focused on "re-interact" (29, 39%) and "overcome" (26, 35%).

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3.2 Product Types

There is significant difference in the number of emotions ($x2=27.8$, $p<0.001$) across product types. Mobile apps were related with more engaging emotions while desktop software was related to more withdrawal emotions ($r=0.283$, $p<0.01$). Figure 3 shows the number of occurrences of emotion categories (engage, unpredictable, withdraw) while interacting with three types of product.
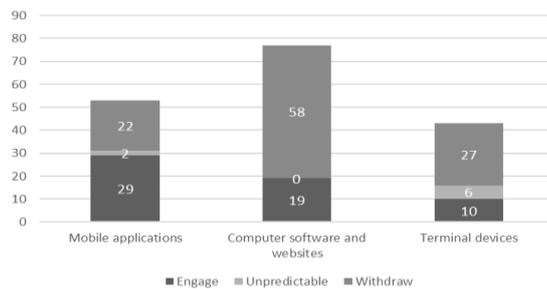

Fig. 3. Emotions distribution on 3 types of product

The most emotion was expressed was withdrawal emotion, while engaging emotions was less expressed. The likely reasons are that withdrawal emotions are less expected and users report withdrawal emotions more often to show their dissatisfaction.

3.3 Product Features

Users' emotional experience was not related to product features. Previous research always focused on the relationship between emotion and interface design. However, correlation analysis shows emotion are not related to product features. It seems these features such as interface, complexity, and speed could evoke both engaging and withdrawal emotions.

3.4 Interaction Results

Users showed engaging emotion on successful interaction while withdrawal emotion on failed interaction. Figure 4 shows the emotion frequencies according to interaction results.

There is significant difference in the number of emotions ($x2=12.904$, $p<0.001$) across interaction results. Emotion is positively correlated with the results of interaction ($r=0.292$, $p<0.01$) that success brings users engaging experience while failure brings users withdrawal one.
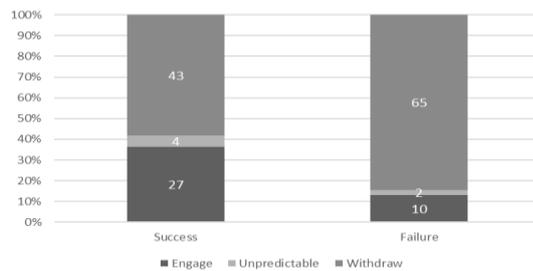
Fig. 4. Emotion distribution on interaction result

3.5   User Behaviors

We found no relation between a user's behaviors and his/her emotional experience, suggesting that what actions users take might be independent from how they feel. This indicates that action readiness [4] does not necessarily lead to action. This needs further investigation.

4   Conclusion and Discussion

In this poster, we report some preliminary results about the emotional experience in different types of information product. We found that emotions were related to product types: mobile apps were associated with more engaging emotions, while desktop software tended to be associated with more withdrawal emotions. Interaction results also have influence on emotional experience: successful interaction resulted in more engaging emotions while failed interaction resulted in more withdrawal emotions. Michalco et al. noted that people form expectations of an interactive product before using it and these expectations influence their attitude towards the product [9]. That explained why people are more positive about mobile devices which led to a more expected outcome.

However, emotions were not related to product features, which is different from results of prior research such as [6]. Our study shows that interface, complexity, and speed of the products have no influence on users' emotions. This difference might be caused by the context of product usage. Product properties might have more influence on product experience with industrial product than with information products. We also found that user behaviors were not related to their emotional experience. This might also be explained by users' expectation of the result of their action, but not by the action itself. This needs further investigation.

In this dairy study, participants were recruited from the same curriculum with similar background. In the future, we could expand the span of participants' backgrounds and redesigned our dairy instructions to elicit user proficiency and context of use. Future research could also examine the relationship between user behavior, expected result of the behavior, and users' emotional experiences.

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