

CSC 497 Interdisciplinary Project Formal Proposal

Topic: Research review of personality traits on HCI user interface

1. Introduction

Human-computer interaction (HCI) is a multidisciplinary research field that focuses on the design of computer technology and the interaction between humans and computers [7]. Personality is the differences in the characteristic pattern of thinking, feeling, and behaving between individuals. It influences people's decision-making, interests, preferences, and life outcome [8]. The well-established Big Five Personality traits model was developed from the 1980s onwards in psychological trait theory. It includes extraversion, agreeableness, openness, conscientiousness, and neuroticism [9]. Personality traits provide the human abilities and limitations that can be taken into account in the design of an effective system in technology. It may take one of the important roles of user's action on the user interface. On the one hand, personality traits influence the way people seek information. People who have low emotional stability will easy to give up on information seeking and have difficulties with evaluating the quality and relevance of the information [6]. On the other hand, personality plays a role in interaction with visual metaphors. People who are extraversion, openness, and agreeableness preferred a decorated visualization of a creature of a user interface [6].

To explore how personality traits play the role of the interaction of user and digital interface, this research will focus on adding personality traits features to e-book reading. The e-book is popular in recent years. Its cheaper price and portability become the reader's preferences. In August 2021 the American Association of Publishers, which mainly represents mainstream

consumer book publishers, reported that among their member e-book sales accounted for 13.7% of sales revenue [1]. It has been a long time that higher education has been transformed by digital technologies, such as the Internet, laptop, mobile phones, and electronic books or eBooks [11]. Kindle is a series of e-readers designed and marketed by Amazon. Users can browse, buy, download, and read e-books, newspapers, magazines, and other digital media via wireless networking. It supports iOS, Android, Mac and PC. In order to see whether personality traits can provide better communication between users and digital interface, this research will add a personality traits feature on the Kindle iOS version.

2. Goals

The main goal of this research is to explore whether personality traits play a role in HCI. Kindle is one of the most popular e-book software, and its full functionality and portability make users love it. This research will add the personality traits feature to test whether personality will provide users a better reading style. The research will take the Big-Five personality test as a reference, allowing users to conduct self-questionnaire on their own personality. The system will provide a personalized reading mode based on user's result. The personalized reading mode includes the color, layout, and functional usability when users read the e-book. The participants in this research will take an evaluation questionnaire to compare the current version of Kindle iOS and the version with the personality traits feature added. The propose is to investigate whether personality traits feature can improve user's satisfaction of reading e-book by kindle.

3. Case Study

3.1 Software: Kindle iOS

The research has decided Kindle iOS version as the software of case study. It is going to add a new feature about personality trait test to recommend a reading mode to users. The user will take a self-questionnaire to test their own personality and the system will provide a reading mode based on the user's result. The reading mode will change the background color includes hue and brightness; layout of the reading page includes font size and spacing; navigation and commenting features.

3.2 Self Questionnaire BFI-10

The research will use the BFI-10 Personality Questionnaire. The BFI-10 is a 10-item scale measuring the Big Five personality traits Extraversion, Agreeableness, Conscientiousness, Emotional Stability, and Openness. It is an open-access instrument that can be used for non-commercial research. The scale was developed based on the 44-item Big Five Inventory (BFI-44; John, Donahue, & Kentle, 1991; Rammstedt, 1997) and designed for contexts in which respondents' time is severely limited. Test-retest correlations suggest acceptable reliability. Correlations with other Big Five instruments, correlations between self and peer ratings, and associations with sociodemographic variables suggest good validities of the BFI-10 scores [10].

A calculation example of myself:

Appendix A. Big Five Inventory-10 (BFI-10)

English version.

Instruction: How well do the following statements describe your personality?

Question #	I see myself as someone who ...	Disagree strongly	Disagree a little	Neither agree nor disagree	Agree a little	Agree strongly
(1)	... is reserved	(1)	(2)	(3)	(4)	(5)
(2)	... is generally trusting	(1)	(2)	(3)	(4)	(5)
(3)	... tends to be lazy	(1)	(2)	(3)	(4)	(5)
(4)	... is relaxed, handles stress well	(1)	(2)	(3)	(4)	(5)
(5)	... has few artistic interests	(1)	(2)	(3)	(4)	(5)
(6)	... is outgoing, sociable	(1)	(2)	(3)	(4)	(5)
(7)	... tends to find fault with others	(1)	(2)	(3)	(4)	(5)
(8)	... does a thorough job	(1)	(2)	(3)	(4)	(5)
(9)	... gets nervous easily	(1)	(2)	(3)	(4)	(5)
(10)	... has an active imagination	(1)	(2)	(3)	(4)	(5)

Scoring the BFI-10 scales:

Extraversion: 1R, 6; Agreeableness: 2, 7R; Conscientiousness: 3R, 8; Neuroticism: 4R, 9;

Openness: 5R, 10 (R = item is reversed-scored).

For example, I got 1 at 1R, its reversed-scored is 5

[1-5; 2-4; 3-3]

Rammstedt, B. & John, O. P. (2007). Measuring personality in one minute or less: A 10-item short version of the Big Five Inventory in English and German. *Journal of Research in Personality*, 41, 203-212.

$$\text{Extraversion: } (1R) = 5 \\ (6) = 3 \quad \frac{5+3}{2} = 4$$

$$\text{Agreeableness: } (2) = 4 \\ (7R) = 3 \quad \frac{4+3}{2} = 3.5$$

$$\text{Conscientiousness: } (3R) = 2 \\ (8) = 4 \quad \frac{2+4}{2} = 3$$

$$\text{Neuroticism: } (4R) = 5 \\ (9) = 4 \quad \frac{5+4}{2} = 4.5$$

$$\text{Openness: } (5R) = 2 \\ (10) = 4 \quad \frac{2+4}{2} = 3$$

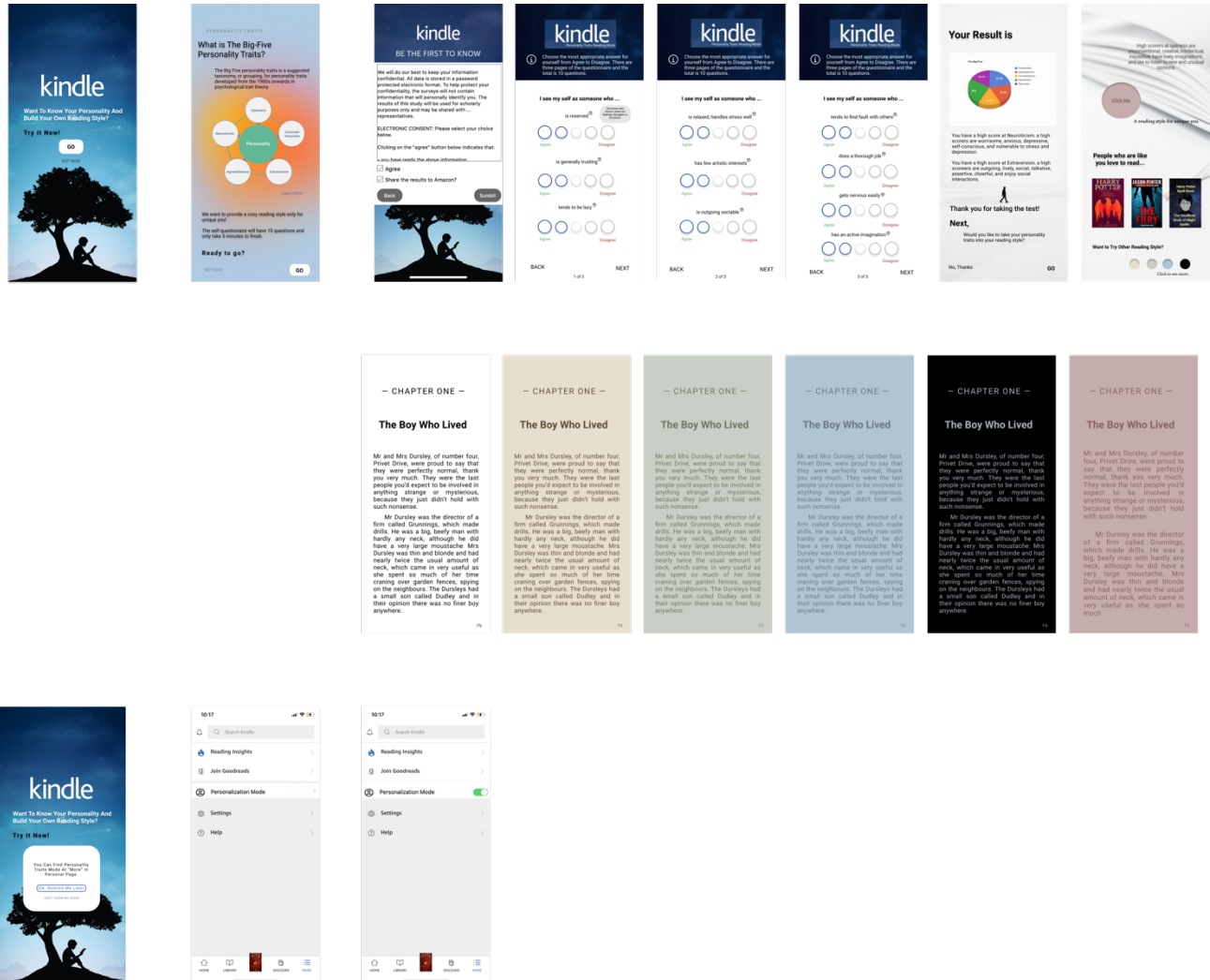
For example, I choose “1” for question (1). Extraversion is 1R which means we need to reversed-scored. “5” is the reversed-score for “1”. Thus, I have “5” for question one. And I choose “3” for question (6). Then for extraversion, I have average $(5+3)/2 = 4$. The range of score should be between 1 to 5.

Calculation example site:

<http://gosling.psy.utexas.edu/scales-weve-developed/ten-item-personality-measure-tipi/>

<https://www.psytoolkit.org/survey-library/big5-bfi-s.html>

3.3 Prototype



Details please see attached PDF or

<https://www.figma.com/file/laQDhQxoXPQpsYap4Cacxq/Kindle?node-id=0%3A1>

4. Next Steps

- Literature Review
 - Relationship between personality traits and color (hue, brightness)

- Relationship between personality traits and preference reading layout (font size, spacing)
- Relationship between personality traits and preference of navigating items
- Ask several users (friends or other people to collect their ideas
- Participant's Evaluation Form & Consent Form
- Collect Results
- Analysis Results & Present Results
- Final Report
- Seminar Presentation

5. Reference

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