

Questionnaire Survey on Attention of Young Adults

Junmin Du^(✉), Weiyu Sun, and Xiaofan Wang

School of Transportation Science and Engineering/Airworthiness Technologies
Research Center, Beihang University, Beijing, China
{dujm, sunwy92, 8709}@buaa.edu.cn

Abstract. Attention plays an important role in guaranteeing the safety and efficiency of task operation. People may get distracted by various internal and external causes. There are differences between individuals in their reaction to the distractions. Understanding the characteristics of attention is the basis for human-machine interface design. In this study, a questionnaire was designed, which concerned personality, environment, task, biological clock, self awareness and self control etc. 138 questionnaires were collected from young adults. Based on the questionnaires, the features of young adults' attention were described. The study results are helpful for the designer to know young people better in the attention characteristics, so as to get benefits for man-machine interface and task design.

Keywords: Attention · Distraction · Questionnaire survey · Young adults

1 Introduction

In order to obtain the satisfied result of using some products, users are expected to concentrate on interacting with the products. However, users may get distracted because of various internal and external causes. Failures of attention could be classified in terms of three categories: selective attention, focused attention and divided attention (Wickens and Hollands 1999). The origin of the selection process could be triggered by the exogenous stimuli depending on salience, or motivated by the endogenous expectations and goals (Engstrom et al. 2013). Human attention resources are limited, which can be allocated, transferred and wasted. Focused attention is affected easily by the changing situation (Wickens 1992; Berti et al. 2004). Divided attention limits describe our limited ability to time-share performance of multi-tasks, or sometimes describe our limits in integrating multiple information sources (Wickens and Hollands 1999). Human brain tends to generate some ideas spontaneously when idle attention resources occur. Researches have shown that humans drift their attention away from the current task frequently if the task is tedious or boring. Their attention would point at something that is irrelevant to the current task, such as past memories and the person concerned (Schooler et al. 2014; Baird et al. 2010; Mrazek et al. 2013).

Human characteristics are the basis for human-machine interface design. Attention is one of the important factors affecting it. A good well understanding of attention would be of help for designing the product in accordance with human characteristics.

This will help in creating more favorable conditions which in turn will enhance mental and physical concentration. As a result, the product to be used will become more effective.

In this research, a questionnaire was designed to find out the attention features of young adults, who were the main users for some certain products. The factors addressed include personality, environment, task feature, self awareness and self control etc. The main goal was to understand the characteristic of young adults' attention.

2 Method

2.1 Participants

150 Chinese young adults participated in the survey. Finally, a total of 138 questionnaires were collected, out of which, 43 were answered by females and 95 by males. Participants' ages were from 18 to 25, in which 5 participants were below 20 years old, 104 participants were from 21 to 23, and 29 participants were above 23. The ratio of introverted and extroverted participants was approximately 1:1, and there was no gender difference. Participants were recruited by posting advertisements at local communities.

2.2 Design

The questionnaire was comprised of 24 items in four sections: basic demographic characteristics, environment, task feature, self awareness and self control.

- Basic demographic characteristics concerned participants' ages, gender, major, personality trait (introversion or extraversion), health condition, major in university (engineering, science, arts, and management).
- Environment concerned the type of exogenous stimuli, such as light, sound, smell, space size, crowded degree, nature time.
- Task feature concerned the difficulty level of tasks (easy, medium and hard), the reason that driven people doing task (interest in, expert in, and compulsory requirement), task contents (reading mathematics, philosophy, history, law, politics, military, poem, manual instruction).
- Self awareness and self control concerned the duration for keeping attention (5–10 min, 10–20 min, 20–30 min, and above 30 min), the endogenous causes which result in distraction (mood, sleepy, interests, goal), when people became aware distraction (could not, after a while, immediately), self control on distraction (no control, after a while, immediately), the perceived difficulty when re-locate attention into task (easy, a little difficult, very difficult), the ability on ignoring distraction (high, low, very low), the self evaluation on attention control (easy, difficult, very difficult).

Most of the questions were single choice questions. A few of the questions were sorting questions. For example, the participants were asked to sort the nature time of a

day (morning, noon, afternoon, evening, night) into the order as they feel easy to keep attention, with 1 being very easy and 5 being very difficult.

3 Results

3.1 Environment

Light, sound and smell affect attention through different sensory channels. More than half of the participants (female 60.5 %, male 55.8 %) believed that sound played a greater role in distraction as compared to light and smell. While 18.6 % female and 24.2 % male regarded light as the No. 1 attracted environmental factor. Also 20.9 % female and 20.0 % male considered smell was the most likely resource that lead to distraction. Although females and males had different opinions on the biggest environmental factor, there were no significant gender differences.

For the response to environmental factors, 61.6 % participants (female 69.8 %, male 56.8 %) reported that they would get distracted involuntarily even if they wanted to pay attention to the task. 35.5 % participants (female 27.9 %, male 38.9 %) said that they could completely ignore the environmental interference and continue with their tasks at hand. While 3.6 % participants (female 2.3 %, male 4.2 %) said that they would be completely distracted, unable to continue the task at hand and would pay attention to the unrelated stimulus. The data showed that most of people could be affected involuntarily by the environment. Comparing with males, females were more likely to be distracted by the environmental factors. Males had more confidence to depress the negative environmental influences than females.

The space size and population density also had an effect on attention. 58.7 % of the participants reported the spacious environment allowed them to focus more easily. The expected space size of introverts in spacious environment for a task was 1.2 times higher than that in small space. The ratio was 1.7 in extroverts. It showed that extroverts were more willing to stay in a larger place for task than introverts. Population density had a greater influence on attention than the space size. The affected range in descending order were high population density in small place (57.2 %), followed by high population density in spacious place (30.4 %), then low population density in spacious place (7.2 %), low population density in small place (5.1 %). Namely 87.6 % participants reported that crowded place (spacious or narrow) would be distracted.

The concentration time was different between genders. For the females, the easiest time to focus on a task was morning, followed by afternoon and evening. But males thought that evening was the best time to concentrate on a task, followed by morning and afternoon. Noon was considered to be the most difficult time for attention, without genders difference.

3.2 Task

Comparing personal interests, job specialization and task requirement, interest was the number one to influence attention of most people with absolute superiority (introverts 55.9 %, extroverts 42.9 %). It was followed by job specialization (introverts 25.0 %,

extroverts 32.9 %) and task requirement (introverts 19.1 %, extroverts 24.3 %). There was no gender difference here.

When asking to do an obligatory task beyond interest, 76.8 % participants reported there was difficult to concentrate but it could be overcome (females 86.0 %, males 72.6 %). 10.9 % participants reported it was easy to concentrate. 12.3 % participants reported it was very difficult to concentrate, unfortunately.

For the tasks with a time limit, 72.5 % participants thought that more time lead to more difficulty in concentration, while relatively less time could make concentration easier. The rest of the participants (27.5 %) took the opposite view.

A task with moderate difficulty was most favorable for concentration. Too easy or too difficult tasks easily caused distraction. The number of people who believed difficult task was more difficult to concentrate was 1.2 times higher than those who believed easy task was more difficult to concentrate. Out of which, 67.6 % introverts supported that difficult task was more difficult to concentrate; while 58.6 % extroverts supported that easy task was more difficult to concentrate. The results also showed that the extroverts believed that they could concentrate more easily when carrying out difficult tasks.

For the reading task, the participants reported that the unfamiliar materials, compared with the materials that belonged to their major, were more difficult for them to concentrate.

3.3 Self Awareness and Self Control

81.9 % participants believed that they could keep focus for 20–30 min or more than 30 min continuously. Out of which, 53.5 % females and 30.5 % males reported for 20–30 min, 30.2 % females and 50.5 % males reported for more than 30 min. It showed that higher percentage of males had longer length of time to keep focus than females. In addition, 14.5 % participant reported that they could keep focus for 10–20 min. 3.6 % participant reported for 5–10 min. There were wide individual differences on keeping attention continuously.

For the causes that result in distractions, 34.1 % participants thought the most important one was the mood; 24.6 % participants thought it was interest on task; 21.7 % and 19.6 % participants thought it was lack of sleep and poor state of health respectively.

Most people (64.5 %) said they need time to aware their distraction state and also need other time to bring themselves to return to task. Most people felt that self awareness of distraction was easy to practice. However, it was difficult to bring oneself to return to task. For example, 34.1 % participants reported that they could self aware mind wandering immediately, and Only 1.4 % participants thought that they could not self aware. However, for the attention return to task, only 27.5 % said they could shift into task at once when they realized their mind wandering state, but as high as 8 % participants said they could not control their mind wandering.

28.3 % participants reported that they had no difficulties at all in bring themselves return to task. 67.4 % participants reported that they had certain difficulties in practicing self control to combat mind wandering although they could return to task finally.

But 4.3 % participants reported that it was very difficult for them to shift attention back to task. Meanwhile, 17.4 % participants reported that they had no difficulties in attention self control. 75.4 % participants reported they had, and 7.2 % participants reported they had great difficulties in attention self control.

4 Conclusions

The distraction could hinder the human from giving feedback to the current task, which may lead to hazardous events. On the contrary, the distraction sometimes helps to speed up the perceived time flow during boring or tedious activities, which is obvious positive for task completion. Understanding attention features would be necessary for tasks and products design.

The study results are helpful for the designer to know young people better in the attention characteristics. They could design products more suitably for people's specific features, and guide the user doing tasks in varying situations. This will make the man-machine interface more effective, make the task procedure more suitable for user, and improve the user experience as well.

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