

Children's Avatar Preferences and their Personalities

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Abstract: Computer games are the most promising tools meeting the children's needs stemmed from the new digital technologies. Thus, educational games are considered as effective ways providing these. However, to make an educational game more effective, one needs to know children's preferences and factors affecting their choices. One of the factors is character features of the games because most children place themselves in the characters and may prefer a game for that reason. This study aims to describe general features of the characters in games by comparing the children's personalities. In order to analyze their personality, children were answered a questionnaire including personality tests measuring *openness*, *conscientiousness*, *extraversion*, *agreeableness*, *neuroticism*. To do this, avatar (game character) was asked to be created from children by using Avatar Studio 1.0 program and a personality test was conducted. Also, demographic data were gathered and semi-structured interviews were conducted to control reliability the created avatars.

Introduction

Internet has been gaining much more importance rather than before in terms of workplaces, educational settings, military usages, health issues. People attempt to use more 3D applications than 2D in today's world. Internet also offers huge communication systems to people even if they live different places in the world. There are also some communication systems such as 2D or 3D that people chat online with each other via Internet. 3D virtual environment is more attractive for people than their counterpart as well. There are a few studies in the literature related to avatar and embodiment in the collaborative virtual environment. Benford et al. (1994) emphasize the importance of embodiment in virtual environment in their study. They stated that using gestures, or facial expressions as emotions in virtual environments are too important for people so that they can identify themselves in a more clear way. Hence, using 3D technologies in virtual environment have been becoming significant among people. Because of these reasons, avatar usage in virtual environment is important. Avatars are the virtual representations of human beings in these places.

It is common truth that avatars have a big power in order to engage students to the computer applications enhance their motivation and keep their attention high during the entire process. Children's avatar preferences should be taken into consideration since game designers or experts try to create one of the most appropriate compute games for children to use in classrooms. We have to analyze children's avatar preferences by thinking of their personalities so as to provide or offer them better educational possibilities while implementing or integrating computer games under game based learning opportunities.

Gunawardena and McIsaac (2003) emphasized the interaction in education. They stated that providing interaction between learner-learner, learner-instructor and learner-content is important to keep quality in education. Avatars can be seen as a chance to bridge this interaction between dynamics of classrooms during a course hour. It is clear that avatar usage also increase interaction among the children in virtual environments. As Prensky (2001) stated that computer games have to have some characteristics to pull or draw people's attention. Furthermore, game characters (avatars) are a representation of human being in a virtual environment, and are attractive tools which improve or engage children's interaction with environment (Mahoney, 2001). Therefore, in this study, we investigated how the personalities of the children's and avatars created by them are parallel.

Methodology

Both qualitative and quantitative approaches were used in this study. The questionnaire, taken from the Five Factor Model of Personality, has five personality traits (Costa & McCrae, 1992): openness, conscientiousness,

extraversion, agreeableness, and neuroticism. While the personality test was analyzed by using a quantitative method, the avatars were analyzed by using a qualitative approach to get depth and detailed information for comparison. Semi-structured interviews and observations were conducted to collect data to see if the avatars created by children were really the characters they wanted to see in a game or not.

Subjects and Procedure of the Study

Two researchers conducted this study in the summer school course given at METU in 2005. The study included 59 students ranging from 7-13 in age. There were three groups which were formed according to the children's ages. The first group consisted of 15 children 7-8 years old, 13 girls and 2 boys. The second group consisted of 19 children 9-11 years old with 10 girls and 9 boys and the third group consisted of 25 children 12-13 years old with 13 girls and 12 boys. Children voluntarily participated to the study. At the beginning of the course, we conducted a personality test to compare the results of this test with the avatar they would be creating. We asked them to use "Avatar Studio 1.0" software and create an avatar which they wanted to see in a game. We first did a short explanation about how they use the "Avatar Studio 1.0". Next, children were asked to create an avatar which they wanted to see in a game and we observed them during these lessons. After they finished creating their avatars, we conducted semi-structured interviews in order to see if there are any factors influence their creation. Despite this check, we couldn't control or prevent interaction between students while they were creating avatars. This is the limitation of the study which should be explained. To minimize the interaction effect, we took notes about children who were highly interactive and when we compared their avatar with their personality test, we used these notes to better understand the results.

Data Collection and Analysis

The main data of this study were each child's personality test and avatar which they each created. Additionally, semi-structured interviews were conducted and each group was observed to get in-depth information. Each child's personality results were compared with their avatar and interview results as well as observation notes. One reason to consider all of these factors is to see if their avatar reflected their personality. The second reason was to learn if they had created avatars which they really wanted to see in a game. Since we assumed children's demographic factors affected their avatar creation, we asked questions to get information about their demographic which include gender, age, father's and mother's job and their location. All of this information was used while the avatars created by children were being analyzed. We brought together each child's data and described an avatar in terms of appearance and features for each child. Then, we investigated all descriptions and made a general description for each personality category.

Results

Gender differences emerged as an important factor which influences the avatar creation. In this study whereas 20 out of 23 boys (except three of them), created male characters, all girls, except one, created female characters. While analyzing the personality test results, we separated the children into four groups under each category as High Male Scorers, High Female Scorers, Low Male Scorers and Low Female Scorers. Our aim was to describe the relationship between their personalities, gender and avatar preferences of each group.

Openness

The first category of the personality test aims to assess creativity of people. According to the explanation of the test results while high scorers tend to be original, creative, curious and complex, low scorers tend to be conventional, down to earth, narrow interests and uncreative.

High Openness Scorers

There were 9 out of 59 High Openness Male Scorers. When we investigated the avatars created by them, we observed that most of them created powerful avatar characters, which look like fighters. Due to appearances and accessories they seem quite fantastic creatures. Gender may be the reason to create such powerful characters because same preference was observed in the Low Openness Male Scorers. Although, most of the Low Male Scorers created powerful fighters, their avatar represent person that can be met in the daily life often. However, High Male Scorers' characters differ from Low Scorers' avatars by their clothes, positions and expressions that their avatars do not represent a person who we can meet often in daily life. For example, one of them created an avatar which is quite different from others' with the red-black skin color and he also emphasized that he wants to see soldier with dying body in the games as a character.

The number of the High Openness Female Scorers was 19 among 59 scorers. Like High Openness Male Scorers, they created avatars that we do not generally meet in daily life in terms of their clothes and appearances. It is also interesting that their avatars are not much similar to each other. They created different avatars from each others although the interaction between children was high during the lesson. Moreover, most of them said they wanted to create beautiful characters like the Low Openness Female Scorers. It may due to their gender. However, their avatars are quite unfamiliar and specific with comparison to Low Scorers' ones.

Low Openness Scorers

There were 14 Low Openness Male Scorers. Unlike the High Openness Male Scorers, their avatars represent people who can be met in daily life in terms both of their clothes and appearances. It is interesting that although all boys said they wanted to see powerful characters in a game, Low Openness Male Scorers created avatars which do not seem fighters. Controversially, they look like businessman or gentle boys. Even they were dressed causal or official, they seems more familiar. Three of them created female avatars due to impacts of the group they were in. According to us all of these may imply their conventional and familiar personality as they reflect it while making avatars. When we asked the reason why he created female character, one of the male children said "Everybody creates a female character but I want to see an avatar in a game. It is mine." Although his character seems unfamiliar, he created them due to impact of their friends.

17 female children who get low scores from openness category had created avatars much familiar and conventional than High Openness Female Scorers' avatars. Like Low Openness Male Scorers' avatars, their avatars looks like worker in business world or film stars and they are much more orderly. In other words, their avatars did not carry any unfamiliar features in terms of their both clothes and appearances. Moreover, they tend to create avatars which look like people around them or characters from another game, cartoons, films. For example, one of the female children said that she tried to create her mother or other said "I wanted to see a girl as beautiful as Barbie in a game and I tried to create it."

Conscientiousness

Second category of the personality test assesses person's reliability, discipline, carefulness. According to Costa and McCrae (1992), high scorers tend to be reliable, well-organized, self-disciplined and careful. Low scorers tend to be disorganized, undependable, and negligent. The high and low scorers separated into 4 groups (High Conscientiousness Male Scorers, High Conscientiousness Female Scorers, Low Conscientiousness Male Scorers and Low Conscientiousness Female Scorers) based on their gender. Especially, to compare self discipline, carefulness and reliability of the children with their avatars, we also benefited from the interview results because they gave some more clues about the avatars they created. Observation results were used to get information about their carefulness.

High Conscientiousness Scorers

Results of high scorer male children showed that 17 out of 23 of them wanted to see their avatars as powerful characters like fighters, soldiers or monsters, others (6 of the male children) created characters looking like gentlemen. In other words, they created two different groups of avatars that one of them can run fast, fly, fight and the other one can dress beautiful like a hardworking school boy. However, these two different characters have some similarities in that both of them dressed suitable with their position and both of them should help people when they have a difficulty.

High Conscientiousness Female Scorers (25 out of 36) had created avatars consistent with their answers of the interview questions like the High Conscientiousness Male Scorers. Their preferences differ from male scorers' with their characters' gender. All of them, except one, created female avatars. Their avatars look like film stars or novel characters. Although some of them are quite crazy, they are consistent with the position what children wanted to create. Actually there are two different characters. While one type of avatars represents any person who can be met in daily life and other one looks like pop or film stars. In addition, it is worth to point out that compared to low scorer females' avatars, their avatars are dressed much more suitable their position. We also observed that they were careful while they were creating their avatars. They took their friends' opinions after creating their characters. For example, another child said "I try to create a character looking like Brads, a cartoon film star. They are quite crazy and beautiful". After she created her avatar, she asked her friends, what they remind when they look her avatar.

Low Conscientiousness Scorers

Low Conscientiousness Male Scorers (6 out of 23) tended to create characters like movie stars. It is interesting that their preferences were similar to Low and High Conscientiousness Female Scorers'. However, their avatar differs from Females' in terms of their gender and color preferences because girls tended to use more colorful clothes. In addition, Low Conscientiousness Male Scorers generally preferred grey and white colors for their avatars' clothes. 5 avatars created by them had funny accessories like tie on a body. Although they said they want to see characters like Spiderman or Batman or Matrix, they create funny characters with funny accessories.

Most girls who got high scores from conscientiousness category had created avatars much crazier than High Conscientiousness Female Scorers'. In fact, their avatars had colorful hair, strange glasses and hats. In addition, their avatars had more colorful clothes. Because of these features, their avatars represent people who we can occasionally meet in the society. Like Low Conscientiousness Male Scorers' avatars, their avatars carry much unsuitable things on them. It is also important to emphasize that most of them mentioned about the same things with High Conscientiousness Female Scorers in terms of what they want to see on beautiful characters in a game. We observed that they did not spend much time to create a beautiful face and they did not give much effort to change body size of the avatars. Although they planned what they create, their avatars did not satisfy them.

Extraversion

Third category of the personality test assesses person's sociability, talkativeness, and friendliness. High scorers tend to be sociable, friendly, fun loving and talkative and low scorers tend to be introverted, reserved and quiet. Nearly half of the children (30 out of 59) were low scorers for "Extraversion" category, 18 girls and 12 boys. On the other hand, 29 out of 59 children were high scorers for "Extraversion" category, 18 girls and 11 boys. We separated the high and low scorers as 4 groups (High Extraversion Male Scorers, High Extraversion Female Scorers, Low Extraversion Male Scorers and Low Extraversion Female Scorers). Moreover, while analyzing children's avatar preferences in terms of their personalities, we investigated and benefited from interview results and demographic characteristics of them. In addition, which kind of avatar they wanted to create was asked. Actually, these and similar questions targeted to assess sociability and friendliness of children by comparing with the avatars created by them.

High Extraversion Scorers

11 children were High Extraversion Male Scorers. Most of their avatars looked like have fun personalities which are appropriate to their personality. 9 of the male children preferred using skin while designing their avatars and 7 of them preferred dark skin as well. One interesting and important point in this issue is that some avatars have unusual appearance. For instance, whereas some of them are sitting, others are hanging their hand or leg. According to interview results, we conclude that High Extraversion Male Scorers were affected by their most favorite characters while designing their avatars. While most of the children stated that they were affected by their favorite character, others were affected by other computer games' avatars. Also, most of the male children want to be their most favorite characters while they are playing computer games. Therefore, they preferred creating avatars looking like their favorite game characters.

18 out of 59 children were High Extraversion Female Scorers. Accessories of the avatars created by the female children were one of the most important design elements of the avatars. Approximately half of the avatars had

bags in their hands, and many of them had bracelet or necklace. High Extraversion Female Scorers created their avatars by using hat and long skirt as well. 16 of them preferred using white color while creating their avatars. All female children created female avatars too. When children's demographic characteristics were investigated, we can say that most of the female children were affected not only by games and their characters but also movies. Almost all children stated that they wanted to be like their most favorite characters while they are playing the game they like.

Low Extraversion Scorers

12 children were Low Extraversion Male Scorers. One of the most important features of the avatars created by male children was that 9 out of 12 Low Extraversion male children prefer creating African avatars. These avatars have jacket and trousers. Other important point is avatars' hair styles and accessories. Nearly half of them were wearing eye glasses, and they have unusual hair styles. Actually, these kinds of avatars can not represent human beings of daily life. Moreover, All Low Extraversion Male Scorers have computers at their home. Most of their favorite game genres are fighting games and action / arcade games. While some of the female children want to be the virtual characters in games they like, others do not prefer this. However, almost all male children stated that they did not try to liken their avatars themselves while creating them.

18 out of 59 children were Low Extraversion Female Scorers. Female children's avatar preferences they created show various differences. Whereas some of them prefer using long skirt, some of them prefer using trousers. Moreover, one of the important issues of this group of female children is they do not prefer using accessories. Also, many of them prefer using sport shoes while designing their avatars. Almost all (17 out of 18) preferred creating female avatars rather than males.

Agreeableness

Fourth category of the personality test assesses person's good natured, sympathetic, and courteous. High scorers tend to be good natured, forgiving, sympathetic and courteous and low scorers tend to be critical, rude, harsh, and callous. 16 out of 59 the children were low scorers for "Agreeableness" category, 8 girls and 8 boys. On the other hand, 43 out of 59 children were high scorers for "Agreeableness" category, 28 girls and 15 boys. We separated the high and low scorers as 4 groups (High Agreeableness Male Scorers, High Agreeableness Female Scorers, Low Agreeableness Male Scorers and Low Agreeableness Female Scorers).

High Agreeableness Scorers

15 out of 59 children were High Agreeableness Male Scorers. When their avatars were investigated, it was observed that 13 of the avatars created were unusual from daily life. They mostly used colorful skins. Due to the skins, avatars do not look like a real human being. Because of the children's personality, agreeableness people are good natured and sympathetic. Their most favorite colors were red and white. However, a few of them created human like avatars. One of the interesting points is that approximately half of the children created their avatars which have only underwear. Also, all High Agreeableness Male Scorers created male avatars. Almost all of the children have computers at their home, and they prefer playing fighting games rather than others including non-violence themes. All agreeableness male children stated that they want to be similar and have identity of the virtual characters which are in games they like playing too much. Because of these reason, they created their avatar according to their most favorite characters in games they play. Although some children preferred creating avatars similar to themselves, agreeableness male children did not prefer this.

In this study, 28 out of 59 children were High Agreeableness Female Scorers. Most of the female children preferred creating cute and pretty avatars which is suitable to their personality. All of the High Agreeableness Female Scorers preferred creating the female avatars. Most of them used accessories such as bags, bracelets, ear rings etc while creating their avatars. Some female children used mini skirts on their avatars. When we analyze their demographic characteristics, most of them like Barbie like games. Almost all females stated that they like playing Barbie and dress their characters in the game. Therefore, most of the female children stated they want to be a game character in the Barbie game.

Low Agreeableness Scorers

8 children were Low Agreeableness Male Scorers. Unlike the High Agreeableness Male Scorers, their avatars represent people who can be met in daily life. Whereas one of the male children preferred using colorful skin while creating his avatars, others did not prefer. One important point is that they used tie on their avatars. All male children preferred creating male avatars as other agreeableness scorers. Because low agreeableness person is rude and harsh, their avatars looked like rude and harsh person too. Moreover, nearly half of the children used beard on their avatars. All children who are Low Agreeableness Male Scorers have computers at their home. Their most favorite game genres are fighting and action/arcade games. There are different opinions on creating avatars among these children. While some of them stated that they want to be their most favorite virtual characters while playing games they like, other children did not prefer these. Therefore, some students tried to liken avatars they created themselves.

In the study, 8 out of 59 children were Low Agreeableness Female Scorers. When their avatars were investigated, we can not group them. For instance, while one of the female children created an African avatar, another one created an Asian. Some females preferred using skirt while creating their avatars as well. Demographic characteristics of these children showed that while many of them prefer playing Barbie like games, some of them prefer playing action / arcade like games. Almost all females except one creating male avatars stated that they want to be their favorite characters in games while they are playing. Moreover, many of the female children want to created avatars looking like themselves, also.

Neuroticism

Fifth and the last category of the personality test assess person's nervousness, insecurity and worrying levels. High scorers tend to be nervous, high-strung, insecure and worrying and low scorers tend to be calm, relaxed, secure, and hardy. 55 out of 59 were low scorers for "Neuroticism" category, 34 girls and 21 boys. On the other hand, 4 out of 59 children were high scorers for "Neuroticism" category and 2 girls, 2 boys. We separated the high and low scorers as 4 groups (High Neuroticism Male Scorers, High Neuroticism Female Scorers, Low Neuroticism Male Scorers and Low Neuroticism Female Scorers).

High Neuroticism Scorers

Only 2 of the children were High Neuroticism Male Scorers. The avatars that created by children were different from each other. Whereas one of the children preferred creating his avatars by clothing it with some colorful dresses, another preferred creating strange avatar. He preferred red and blue colors. There is also suitability with avatar's clothes to shoes in terms of colors as well. One of the avatars had unusual hair type. Like High Neuroticism Male Scorers, High Neuroticism Female Scorers were only 2 out of the all children. There are suitability in terms of clothes types, accessories, hair styles, shoes, and colors of these among the avatars created by the female children.

Low Neuroticism Scorers

21 children are High Neuroticism Male Scorers in the study. One of the most important issues related to avatars created by Low Neuroticism male children is that approximately half of the avatars are African and they have jacket on them. Also, hair design and styles of the avatars are unusual when they are compared with High Neuroticism Male Scorers'. 18 out of 21 children painted their avatars hair as white color, while they prefer creating African avatars at the same time. On the other hand, when male children's demographic characteristics are investigated, we can say that almost all of them have computers at home. Their most favorite game genres are respectively action / arcade games, fighting games, and strategy games. They also stated that they want to be their most favorite characters of the games while they are playing. When they created avatars according to their interests, most of them stated that they did not try to liken their avatars to themselves. 34 out of 55 children were High Neuroticism Female Scorers. When their avatars are examined, we can say that many of female children preferred using mini or long skirt rather than trousers. They also did not prefer using dark colors while designing their avatars. Most of avatars have accessories such as bracelets, necklace, and watch.

Discussion and Conclusion

The challenges in the classroom are that there are efforts to carry learning environments into the environments in games, as well. Making learning more effective is strictly connected with giving the learner more control and providing interaction between learner and content in classroom. We investigated avatar choices of children to provide them more control while they are playing games. A personality test was conducted and compared with avatars created by them. The personalities of the children were classified into five categories as *Openness*, *Conscientiousness*, *Extraversion*, *Agreeableness*, *Neuroticism*. They were also analyzed as high, low scorers and male, female children. Also, the study indicated that there are differences between high and low scorers' avatar preferences with regard to their gender. Firstly, while most of the male children (except three of them) had created male avatars, female children (except one of them) had created female avatars. In addition, while male students said that they wanted to see powerful fighters in the games, females said they wanted to see beautiful and good fashioned characters. Secondly, their avatars differ from each others' with regard to their scores that they get from personality test. To investigate them deeply, we described general avatar preferences for every item by separating them into four groups as High Male Scorers, Low Male Scorers, High Female Scorers and Low Female Scorers. First item is "Openness" that assesses creativity of children. Whereas high scorers tended to create extreme characters which are not easily met in the society low scorers tended to create quite conventional ones. Second item of the personality test is *Conscientiousness* and it assesses person's reliability, discipline, carefulness. While High *Conscientiousness* scorers created the characters which are consistent with their sayings, low scorers created characters which are not consistent with what they said.

Moreover, whereas 9 out of 11 high extraversion male scorers prefer using skin features while designing their avatars having unusual appearance and 7 of them prefer dark skin as well, accessories of the avatars created by the high extraversion female scorers are one of the most important design elements of the avatars. Also, approximately half of the avatars have a bag in their hand, and many of them have bracelets and necklaces created by females. However, the avatars created by low extraversion male scorers are African. Low extraversion female scorers do not prefer using accessories. Also, 15 out of 18 of Low extraversion female scorers prefer using sport shoes while designing their avatars. When high agreeableness male scorers' avatars were investigated, it can be easily seen that 13 out of 15 avatars created by them are unusual from daily life. They mostly used colorful skins while creating their avatars. Due to the skins, avatars do not look like a human in real world. 25 out of 28 High agreeableness female scorers prefer creating cute and pretty avatars. Nevertheless, agreeableness male scorers prefer creating male avatars as other agreeableness scorers. Because low agreeableness refers to being rude and harsh, we can say that their avatars look like rude and harsh people, too. Low agreeableness female scorers prefer using skirt while creating their avatars as well.

One interesting point in this issue is that one of the Low agreeableness female scorers created her avatar which looked like male avatars. Last personality item we took into consideration is neuroticism. Some high neuroticism male scorers prefer creating their avatars by dressing them up with colorful dresses while others prefer creating avatar which do not look like human being. There is suitability in terms of clothes types, accessories, hair styles, shoes, and colors of these among the avatars created by the high female scorers'. On the other hand, low neuroticism male scorers' hair design and styles of the avatars are unusual when they are compared with others. Many students painted their avatars' hair as white color, while they prefer creating African avatars at the same time. In addition, many of low neuroticism male scorers prefer using mini or long skirt rather than trousers. They also do not prefer using dark colors while designing their avatars.

However, to use avatars may not provide interaction and control for users. There is another important issue to pay attention to which are the children's preferences about avatars. But how can a designer design avatar to meet a diversity of users? That is why we focus mainly on the children's personality and their avatar choices. So, we may guide game designers about the avatar choice by giving general information about students' personality and their avatar choices.

On the other hand, from the light of the result of the study, educators and instructors should take into consideration while they are using avatars as pedagogical agents in virtual environments embedded a context for educational purposes. It is clear that avatar preferences of the students have a direct relationship with their personalities. Therefore, students should be given a chance to select their favorite avatars, which are the most appropriate for themselves in these places. More studies, which investigate characters preferences, should be conducted.

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