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Identity styles in adolescents and the adolescent–avatar gender and skin color consistency

Abstract: Avatars are virtual representations of users. Creating a virtual representation can be considered an important element of the identity formation process in modern adolescents and the choice of avatar's gender and skin color is crucial; however, the number of such studies is very limited. The first aim of this study is to check whether adolescents choose their avatar gender and skin color in line with their own. As its second goal, the study examines the relationship between adolescent identity styles and the consistency of the avatar's gender with the user's gender and the consistency of the skin color with the user's skin color. In this study, 130 adolescents played the Characterium computer game and they underwent an assessment of their identity styles. The vast majority of the study participants created avatars according to their gender. About a third of adolescents chose their skin color for the avatar: almost half of the girls and a few boys. No relationship was found between the adolescents' identity styles and two variables: gender consistency and skin consistency. I consider this study to be a step forward in understanding the relationship between forming identity in adolescents and their virtual representations – avatars.

Keywords: *identity styles, virtual identity, avatar customization, adolescence, gender, skin color*

INTRODUCTION

REAL-LIFE IDENTITY

Identity formation is one of the essential aspects of adolescence. In early studies of identity formation, researchers focused on the outcome of the process, but more recently, they have become more interested in the process itself (Berzonsky et al., 2011). Nowadays, one of the most developed concepts of identity is the concept of Berzonsky's identity styles (Berzonsky, 1992). The researcher distinguished three identity styles: informational, normative and diffuse-avoidant. This division is based on different strategies for processing self-related information and identity development.

People with an **informational processing orientation (informational identity style)** actively construct their own identity (Berzonsky, 2016). They look for new self-related information with an open mind and are not afraid of the search outcomes (Berzonsky & Ferrari, 1996; Berzon-

sky et al., 2011; Berzonsky, 2016). Their thinking is rational and critical, and they are ready to reject old and adopt new views as a result of incoming information (Berzonsky, 1992; Soenens et al., 2005). The most frequently used coping strategy by this group of people is a problem-focused coping strategy. The informational identity style is positively associated with values such as tolerance, the welfare of humankind, being helpful, responsible, and honest (Berzonsky et al., 2011). Moreover, it is associated with five dimensions of mental well-being: autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance (Berzonsky & Cieciuch, 2016).

When confronted with identity-relevant issues, adolescents with a **normative processing orientation (normative identity style)** follow standards and expectations represented by significant others (Berzonsky et al., 2011; Berzonsky, 2016). They are closed to other beliefs, ideas and values and want to maintain the existing identity



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structure by rejecting information that does not confirm their self-image (Berzonsky, 2016). Values such as security and tradition are important to people displaying the normative identity style (Berzonsky et al. 2011). These individuals tend to use both maladaptive and problem-focused coping strategies (Berzonsky, 1992; Berzonsky & Ferrari, 1996)

People with a **diffuse-avoidant processing orientation (diffuse-avoidant identity style)** are very little involved in the identity formation process (Berzonsky, 2016). They avoid making self-related decisions for as long as possible, usually until they are forced to make a choice by external, situational demands, potential consequences or the people they are currently with. In an identity conflict situation, these people tend to choose strategies focused on avoidance and emotions: wishful thinking or distancing oneself (Berzonsky, 1992; Berzonsky & Ferrari, 1996; Soenens et al., 2005). They care about reducing both tension and the level of stress (Berzonsky, 1992). This style is positively related to values such as hedonism and power (Berzonsky et al., 2011) and negatively to all six dimensions of mental well-being: self-acceptance, personal development, life purpose, autonomy, control over the environment and positive relationships with other people (Berzonsky & Ciecuch, 2016).

REAL-LIFE AND VIRTUAL-LIFE IDENTITIES

Creating an avatar, i.e. a representation of the player, is an essential component of many computer games. This process involves flexible character design by selecting, from the available options, a number of physical and mental characteristics that are found in the character creator. This is how players create their virtual identity, and this process can be considered an important element of the identity formation process in modern adolescents.

The analysis of identity formation needs to include the possibilities offered by the virtual world (Davis & Weinstein, 2017; Nagy & Koles, 2014). Some researchers consider real and virtual identities to be identical, some see only between them, others describe them as completely different. Gee (2003), Palfrey and Gasser (2008) and Thomas (2007) postulate that when creating their avatars, players construct completely new identities. According to Filiciak (2003), regardless of the number of avatars created, there is one identity that connects them. Kuznetcova et al. (2018) share a similar view and emphasize that creating an identity in the virtual world is a more complicated process than simply creating a new identity. Kolo and Lüst (2019) suggest that games should be treated as a tool for managing one's own identity, and not as a way to take on an alternative self. Gromkowska (1999) adopts a critical position towards virtual identity, treating it as an opposition to real identity. The researcher emphasizes that in the real world, identity creation is a deliberate and tedious process, while in the virtual world, it is often accidental and immediate. In addition, the researcher uses the term "identity epidemic" to refer to the constant changes of identity by users, which

contradicts the idea of a stable identity based on socially acceptable criteria. Meanwhile, Bałuch (2016) believes that the creation of a comprehensive human identity requires the integration of real and virtual identities. Similar conclusions were drawn by Doh and Whang (2014), who observed that identity evolves from a "shared identity" between the game world and real life to an "integrated identity". The virtual world also allows identity testing and its gradual transfer to the offline world (Craig & McInroy, 2014). According to Donath (1999), it is precisely the various relationships that occur between the real and the virtual self that make identity a construct in the online world even more complicated than in the offline world.

Virtual identity is defined by Van Kokswijk (2007) as a representation of identity in a virtual environment. It can be understood in two ways (Šmahel, 2003). The first meaning relates to the collection of personal data that facilitate the identification of the individual. The virtual identity is represented by a nickname, username or email address. In the second definition, identity is a complex conceptualization of the virtual self, represented by thoughts, emotions and fantasies that are assigned to virtual representations (Subrahmanyam & Šmahel, 2011). Today, popular virtual representations of users are avatars. Kang and Kim (2020) found that by adjusting the avatar, individuals can think about themselves, and express their core values as well as their identity, thus experiencing the integrity of the self. The creation of an avatar tends to be the first stage of a computer game, and it uses the customization process (Dix et al., 1998). It involves the unconstrained design of one's own character by choosing a range of physical and mental characteristics from the options available in the character creator (Villani et al., 2016). This process is known as avatar customization or personalization. It refers to the choice of appropriate skills (which enhances gaming performance), external appearance (which does not affect gaming performance), or other characteristics not directly related to performance but which affect gaming enjoyment (Turkay & Adinolf, 2010). The importance of the virtual-real identity relationship is also observed in the context of the game experience. On the one hand, there are a number of studies showing that similarity of the player and their avatar is related to the identification with the player or the level of immersion Birk et al., 2016; Hooi & Cho, 2012; Poncin & Garnier, 2012; Trepte & Reinecke, 2010). These results are reinforced by reports of the studies on anthropomorphic avatars. For example, Sierra Rativa et al. (2020) found that less artificiality in avatars is associated with a higher level of immersion in players. Similarly, Kao (2019) showed that anthropomorphic avatars (human characters and robots) can influence identification with the avatar and, as a result, the game experience. However, anthropomorphic features are not the only ones that influence identification with an avatar and identification with a non-anthropomorphic character is possible (Aymerich-Franch, 2012). Moreover strengthening anthropomorphism may have no effect on identification (Banks, 2017).

On the other hand, researchers also demonstrate the relationship between non-humanoid avatars and gaming experience. As indicated by Krekhov et al. (2019), players can strengthen their relationship with non-humanoid avatars (e.g. a rhinoceros) through the illusion of virtual body ownership. Such embodiment of non-human characters also enhances game enjoyment due to the acquisition of superhuman skills. In addition, the relationship between virtual-real identity and in-game experience may also depend on the camera perspective. Denisova and Cairns (2015) showed that regardless of the preferences declared by players, they experience stronger immersion when using the first-person perspective, i.e. when the avatar is (largely) not visible.

Virtual identity and identity styles

So far, only a few studies have addressed the avatar-identity issue. To the best of my knowledge, only two studies have examined the relationship between Berzonsky's (1992; 2016) identity styles and avatar choice. Li et al. (2013) hypothesized that people with the diffuse-avoidant identity style, who are prone to wishful thinking and use avoidance-based problem-solving strategies, will be more likely to use computer games as tools to play with identity, and as a result, they will identify more strongly with an avatar. According to the researchers, identification occurs when the players accept and value certain aspects of their avatar and perceive them as important elements of their real identity. They distinguished four aspects of identification: the emotions felt during the game, the feeling of being absorbed during the game, the positive attitude towards the avatar and the importance of the avatar for one's identity. The researchers confirmed their hypothesis: people with diffuse-avoidant identity style scored higher than those with the informational and normative identity style in terms of in-game absorption and avatar importance in relation to their own identity. Based on the characteristics of three identity styles, Linares et al. (2011) put forward hypotheses about what avatars will be created by users of the virtual world of *Second Life* (Linden Lab, 2013). The researchers expected that: for people with the normative identity style, the appearance and attractiveness of the avatar as well as its interactions with other users and role-playing, will be important; people with the informational identity style will spend more time socializing with others; while people with a the diffuse-avoidant identity style will be less involved in role-playing and socializing. Only the first hypothesis concerning the normative identity style was confirmed. This identity style was an important predictor of beliefs about the importance of avatar appearance and attractiveness, and these beliefs were related to the activities undertaken: role-playing and establishing relationships with others.

Gender and skin color are particularly important characteristics of an avatar's identity (Dunn & Guadagno, 2012; Kafai et al., 2010; Rahill & Sebrechts, 2021). However determining the direction of the relationship between identity styles and avatar-player gender and skin consistency is a complex issue. People with an informa-

tional identity style look for new self-related information (Berzonsky & Ferrari, 1996; Berzonsky et al., 2011; Berzonsky, 2016). Depending on how they assess it, they can maintain their identity or modify it. On the other hand, people with a normative identity style want to maintain the existing identity (Berzonsky, 2016), so they are more likely to create avatars similar to themselves. Linares et al. (2011), however, postulate that role-playing will be important to them. They can therefore create both similar and dissimilar avatars. As expected by Li et al. (2013), people with diffuse-avoidant identity style should use computer games as tools to play with identity. However, they are very little involved in the identity formation process (Berzonsky, 2016). It is therefore also possible that they will create avatars similar to themselves in order to avoid engaging in identity questions (e.g. Who would I like to be?). Moreover, considerations regarding identity change usually concern those aspects that are relatively easily modifiable (e.g. profession). Gender and skin color seem to be the core of identity, but they are difficult to change. Therefore, on the one hand, an avatar can be a tool with which the "impossible" becomes "possible". On the other hand, it may be an unattractive tool for experimenting with identity because it is unrealistic to implement in life.

Avatar and gender

The selection of an online gender is one of the key elements of the process of creating an online identity. Bruckhman (1996) underlines that choosing a gender that is different from our own can change the way players think about themselves and, consequently, who they are. The choice of male or female representation in the online world is a fundamental decision that may define the entirety of subsequent decisions regarding both the avatar's appearance and behavior. When more than 20 years ago, Dietz (1998) analyzed the most popular Nintendo console games available at that time, he noted that 41% of the games containing characters did not include women. Currently, players create their avatars based on binary gender classification, having a choice between a male and female character (Blodgett et al., 2007). The choice of an avatar's gender (in relation to one's own gender) is not obvious, however. It is influenced by both the player's gender and the game requirements (Martens et al., 2018; Trepte et al., 2009; 2011). Some players however view changing gender online as unfair, manipulative behavior (Roberts & Parks, 1999).

Some people choose their gender for the avatar, and others change it (Griffiths et al., 2003; 2004). Sung et al. (2011) found a 98.5% gender match between the avatar and its creator. Depending on the study, researchers indicate that gender swap is made by 15% (Griffiths et al., 2003) to 60% of players (Hussain & Griffiths, 2008; Griffiths et al., 2004). In 2007, the Global Market Institute (research center in New York; Au, 2007) conducted a survey among almost five hundred *Second Life* players (Linden Lab, 2013). As many as 64% of users answered positively to the question of whether they had a different

identity in the game than in reality, and 23% of the respondents indicated a different gender. In a study by Rahill and Sebrechts (2021), among participants who were asked to create an avatar unlike themselves, 43% of women and 35% of men changed their gender. Taking into consideration the fact that gamers change their gender online, researchers pose yet another question: who does it more often, men or women? Ratan et al. (2019) established that women show a stronger (than men) preference for choosing the same gender all the time, and they prefer to use female avatars. Similarly, Paik and Shi (2013) established that 40% of men and 18.7% of women swapped their gender in the game.

The motives behind gamers' decision to change their gender are very diverse. They can be directly related to gameplay. The gender of an avatar may affect its abilities (Chou et al., 2014; Paik & Shi, 2013) or may offer better in-game statistics (Hussain & Griffiths, 2008). Therefore, it is possible for a male or female avatar to demonstrate skills that are particularly desirable at a certain stage of the game. In consequence, the choice of a specific avatar may increase the players' chances in the game. Cognitive curiosity also plays a vital role. Players want to find out whether choosing a gender different from their own will be detectable to them in any way (Hussain & Griffiths, 2008), and it is considered refreshing (Chou et al., 2017). This is related to experimenting with such aspects of oneself that cannot be changed in real life and taking on roles other than those performed on a daily basis (Hussain & Griffiths, 2008; Paik & Shi, 2013; Roberts & Parks, 1999). In addition, gender swap allows a better understanding of the male/female way of acting and thinking, which can improve relationships (Hussain & Griffiths, 2008) and allows players to meet their need for closeness when a partner is too busy in the real world (Chou et al., 2017). Players also change gender in the game for fun (Hussain & Griffiths, 2008) or anonymity (Song & Jung, 2015). Changing one's gender may also be linked to social motives. On the one hand, players want to maintain relationships with other players, so they adapt to existing online groups (Chou et al., 2017; Paik & Shi, 2013). On the other hand, this may result from the negative consequences of presenting one's own gender during social interactions. This is especially true for women, who emphasize that they change their gender because of the negative experiences linked to playing a female avatar, e.g. sexualization and obscene comments (Chou et al., 2014). A similar trend was noted by Hussain and Griffiths (2008). In their study, women also pointed to the sexualization of their characters as the reason for their decision. At the same time, men pointed to the benefits of presenting themselves through female avatars. They observe that women are treated better than men in virtual worlds; it's easier for them to make friends online and get more free game-related items (from male players). Ratan et al. (2019) argue that women change their gender less often than men because they are under more pressure to reveal their real gender identity, and they are, therefore, less likely to experiment with it. Huh and William (2010) put

forward a different hypothesis. They claim that since women entertain less power in the real world, they are more likely to change their gender in the virtual world. Nevertheless, they failed to confirm this assumption. In their study men were more likely to switch genders than women. In a study by Chou et al. (2017), men indicated that female avatars are accosted more often than men, which makes it easier for them to establish relationships. Yet another reason for changing gender in the virtual world may be the value of the avatar. Castronova (2003) compared the prices of male and female avatars in the game market. As the avatar's gender does not affect the character's skills, this particular variable plays a smaller role in estimating the value of the character than its abilities do. Nonetheless, there is a noticeable difference in avatar prices – male avatars are more expensive than female avatars.

The virtual world provides the opportunity to both faithfully recreate various aspects of one's self and to experiment with them. Therefore, it is an attractive tool for adolescents who are in the process of shaping their identity, as it allows them to try "different versions of themselves". The question they ask "who am I?" expands to include the aspect of "who am I in the virtual space?". Selecting an avatar's gender is a fundamental element in creating a virtual identity (Kafai et al., 2010; Rahill & Sebrechts, 2021). Users sometimes choose the avatar's gender according to their own gender (Sung et al., 2011), and sometimes they choose the opposite gender (Au, 2007). However, the relationship between the identity of adolescents and the choice of the avatar's gender is not clear. As indicated earlier, each identity style may be related to both choosing one's gender and experimenting with it. The purpose of this study is to fill this gap. Therefore, two research questions were posed:

RQ1 Is there a consistency between the avatar's gender and its adolescent creator's gender?

RQ2 Is there a relationship between adolescents' identity styles and the consistency of their gender with the gender of the avatars?

Avatar and skin color

One of the most visible aspects of the phenotype is the skin, which is distinguished by, among others, a large range of genetically determined colors (Jablonski, 2004). Choosing an avatar's skin color is, therefore, a vital component of creating your own virtual representation. However, when Dietrich (2013) analyzed all offline RPGs released in the United States between 2000 and 2010, and over 60 online MMORPGs available in the early 2010s, he established that in most games, there was no option to select a race other than white, and if such an option was available, white avatars were always set as the default choice. Similar conclusions were arrived at by Higgin (2009), who pointed at the privileged role of the white race, and by Glaubke et al. (2001), who, after analyzing 70 best-selling games in the USA, observed that most characters were white and white avatars were the only human characters in children's games. Meanwhile, skin

color is one of the primary determinants of racial identity (Chavez & Guido-DiBrito, 1999). Despite the significant role played by skin color in identity development, there is limited psychological research addressing this issue.

Drawing on data related to the dominance of the white race in computer games, researchers are trying to assess the consequences of this phenomenon. Lee and Park (2011) studied this particular issue in the game entitled *Second Life* (Linden Lab, 2013). The researchers prepared two sets of avatars. The first set featured white characters, while the second comprised racially diverse avatars. Each avatar in the “white” group had a counterpart in the “mixed” group, and the only difference between them was skin color. The study included 30 representatives of the white race and other races, including Asians, Asian Americans, Africans, African Americans, and Latino Americans. In the first part of the study, participants were instructed to review the profiles of *Second Life* (Linden Lab, 2013) users who had made unique and interesting achievements in the game. In the second part, the respondents created their own avatars. The researchers confirmed that non-white study subjects who were presented with white avatars were less likely to declare their sense of belonging and desire to participate in the game. Using the same research procedure, Lee (2014) tested how the representation of racial diversity through avatars is related to the online disclosure of racial identity by racial minorities. The pretest study determined which racial category each avatar belonged to. Two sets of characters were prepared this way – one with low and one with high racial diversity. Both black and white participants were included in the study proper. Their task, as in the previous study, was to review avatars and then create their own character. The participants were asked to create their own representations, which would enable them to establish strong social relations with other *Second Life* (Linden Lab, 2003) residents and provide them with a solid and stable reputation. Based on the data collected, it was found that African Americans who were presented with a set of avatars with low racial diversity were less willing to reveal their identity when compared to African Americans who viewed profiles of avatars with high racial diversity. According to the researchers, the results of both experiments prove that the exposure of ethnic-racial minorities to the dominance of the white race can cause them to feel that their racial identity is under threat.

In 2007, the Global Market Institute (research center in New York; Au, 2007) conducted a survey among almost five hundred *Second Life* players (Linden Lab, 2013). As many as 64% of users answered positively to the question of whether they had a different identity in the game than in reality, and 22% of respondents indicated a different skin color. In a study by Rahill and Sebrechts (2021), among participants who were asked to create an avatar unlike themselves, 39% of women and 47% of men changed their skin color.

The choice of skin color is, like gender, a fundamental element in creating a virtual identity (Kafai et al., 2010; Rahill & Sebrechts, 2021). Previous studies have found

that individuals sometimes choose their own skin color for an avatar and sometimes a different skin color (Au, 2007; Rahill & Sebrechts, 2021; Sung et al., 2011). However, the relationship between the identity of adolescents and the choice of the avatar’s skin color is not clear. As indicated earlier, each identity style may be related to both choosing one’s skin color and experimenting with it. Therefore, two research questions were posed:

RQ3 Is there a consistency between the avatar’s skin color and its adolescent creator’s skin color?

RQ4 Is there a relationship between adolescents’ identity styles and the consistency of their skin color with the skin color of the avatars?

CURRENT STUDY

Method

Study participants

A total of 130 Polish high school students (75 girls, 55 boys) aged 15–17 ($M = 16.53$; $SD = 0.60$) participated in the study. All respondents declared that they had played computer games at least once in their lives. Among all adolescents, 14.6% indicated that they do not currently play computer games, 27.6% that they do it less than once a month, 12.4% once a month, 16.9% once a week, 18.5% several times a week, and 10% play every day. The consent to voluntary participation in the study and the GDPR (General Data Protection Regulation drafted and passed by the European Union) forms were signed by all study participants and their parents/caregivers. No remuneration was offered.

Procedure

Each adolescent participated in the study individually. Before explaining the research procedure to the study participants, the researcher presented the general purpose of the study: to establish how different people play computer games. At the beginning, the study participants signed the consent to participate in the study and the GDPR form. After this part, they started playing the computer game: first they created their avatar, and then the actual game was launched. The avatar creation phase had no time limit, and the game was played for five minutes. Subsequently, the participants completed several scales and questionnaires. The entire research procedure took about one hour. After its completion, the participants of the study received information about the proper purpose of the study. The research was conducted in September–October 2020 in schools and dormitories during the students’ off-school time. Either a computer from the school computer lab was used, or the researcher used their own laptop. The study was approved by the Ethics Committee at the Institute of Psychology of the Jagiellonian University in Kraków.

Measures

Identity styles – the sum of points obtained from the diagnostic questions for each (informational, normative and diffuse-avoidant) identity style in the Polish adaptation

(Senejko & Łoś, 2015) of the revised Identity Style Inventory (ISI-5; Berzonsky et al., 2013). The range of results for each subscale is between 9 and 45. The greater the number of points, the greater the intensity of the style. The study participants responded to forty-eight items on a scale from 1 (definitely does not fit me) to 5 (definitely describes me). Cronbach's alpha coefficient of the Polish adaptation of the questionnaire (Senejko & Łoś, 2015) is .77 for the informational identity style scale of 9 items (e.g. "when faced with a life decision, I try to analyze the situation to understand it"); .68 for the normative identity style scale of 9 items (e.g. "I think it is better to adopt a fixed set of beliefs than to be open to new views"); .71 for the diffuse-avoidant style scale of 9 items (e.g. "now I do not think about my future at all because it is distant to me"). Cronbach's alpha coefficients obtained in this study are: .68 for the information identity style scale; .68 for the normative identity style scale; .69 for the diffuse-avoidant identity style scale.

Adolescent gender – gender declared by the study participants in the Personal Data and Computer Games Experience Questionnaire. This variable can take one of two values: female or male.

Adolescent skin color – the color of the skin declared by the study participants in Personal Data and Computer Games Experience Questionnaire. This variable can take one of four values shown in Fig. 1.



Fig. 1. Selection of skin color in the questionnaire

Avatar gender – the gender selected for the avatar. This variable can take one of two values: female or male.

Avatar skin color – the skin color selected for the avatar. This variable can take one of four values (see Fig. 1).

Gender consistency – the relationship between the study participant's gender and the gender of the avatar. This variable can take one of two values: consistency or no consistency.

Skin color consistency – the relationship between the study participant's skin color and the skin color of the avatar. This variable can take one of two values: consistency or no consistency.

Frequency of playing computer games: frequency of playing computer games declared by the study participants in Personal Data and Computer Games Experience Questionnaire. This variable can take one of six values: every day, several times a week, once a week, once a month, less than once a month, never.

Experience with computer games: study participants' answer to the question "Have you ever played computer games?". This variable can take one of two values: yes or no.

Computer game description

The *Characterium* computer game was designed for this project. It consists of two parts: the first part is a character creator in which players create their avatars; the second part is the actual game, in which the participants

control the avatar they created. Players can customize the avatar with a wide array of facial features, hairstyles, body shapes, outfits, accessories and competencies (see Fig. 2). In the beginning, players choose the gender of the avatar, with access to certain items of clothing and hairstyles dependent on it. The avatar creator has been designed to closely resemble the creators in real computer games. Currently, players typically create their avatars based on a binary gender classification, with a choice of male and female characters (Blodgett et al., 2007). This means that the male avatar and the female avatar have different properties (e.g. clothing, accessories, hairstyle).

Characterium is an arcade game in which the player has to jump upwards onto bars whilst trying not to fall off for a period of five minutes (see Fig. 3). The avatar is controlled like in other commercial computer games: the space button causes the avatar to jump and the arrow keys move the avatar right and left. There are obstacles flying across the screen and the bars gradually increase their speed. The goal of the game is to score as many points as possible: the player gets 20 points for jumping onto the bar and loses 50 points for falling off and hitting the ground.

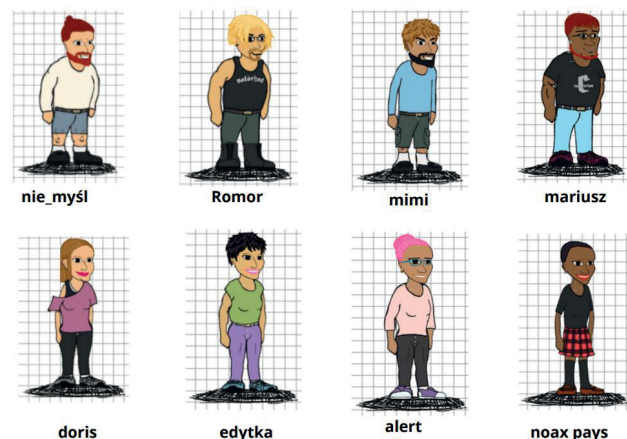


Fig. 2. Sample avatars created by study participants

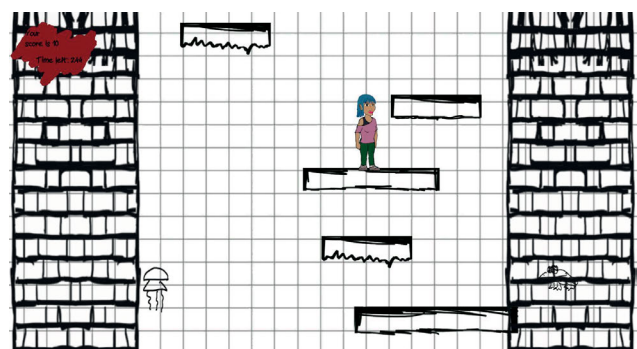


Fig. 3. Computer arcade game *Characterium* developed for the study

Results

Statistical analyzes were performed using the IBM SPSS Statistics 25 package. Results were noted as statistically significant if a *P*-value of .05 or less was

obtained. First, the avatar gender choice was analyzed (RQ1). The result of the chi-square test indicates that the numbers of boys ($n = 55$) and girls ($n = 75$) were similar ($\chi^2(3) = 3.01$; $p = .079$). It was established that most adolescents chose avatars matching their gender. Based on the chi-square test performed, it was determined that the measured dependency was statistically significant ($\chi^2(1) = 64.86$; $p < .001$; $\phi = .71$). Detailed results are presented below (Fig. 4).

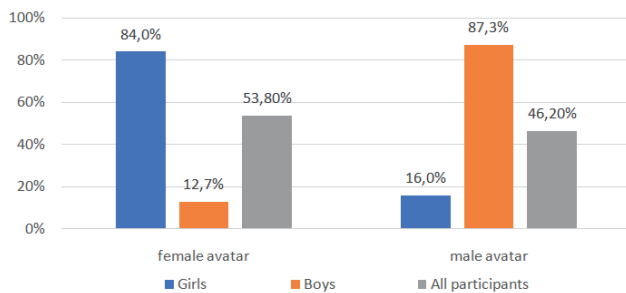


Fig. 4. Choice of avatar gender by adolescents

Subsequently, the avatar skin color choice was analyzed (RQ3). All study participants declared that their skin color is number 1. Consistent avatar skin color was chosen by about a third of adolescents, including 49.3% of girls and 18.2% of boys. The relationship between the choice of avatar skin color and gender was statistically significant ($\chi^2(3) = 15.21$; $p = .002$; $V_c = .34$). Using the Z-test for proportions with the Bonferroni correction, a statistically significant difference was shown between the proportions for white (more often chosen by girls) and light brown (more often chosen by boys) skin color. Detailed results are presented below (Fig. 5).

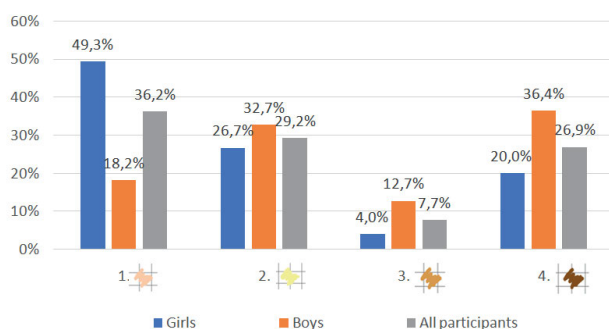


Fig. 5. Choice of avatar skin color by adolescents

Finally, the relationship between the adolescents' identity styles and the consistency of their gender with the gender of avatars was analyzed (RQ2), followed by the assessment of the relationship between the adolescents' identity styles and the consistency of their skin color with the color of the avatar's skin (RQ4). For this purpose, Pearson's (r) correlation was used. The results are presented in Table 1. There were no statistically significant relationships between the identity styles and the gender consistency and between the identity styles and the skin color consistency.

Table 1. Correlation between adolescent identity and gender consistency and between adolescent identity and skin color consistency

Consistency dimensions		Informa-tional identity style	Normative identity style	Diffuse-avoidant identity style
Gender consistency	<i>r</i>	.06	.04	-.04
	<i>p</i>	.515	.652	.619
Skin color consistency	<i>r</i>	.00	.06	-.10
	<i>p</i>	.958	.499	.261

Discussion

The first issue we investigated in this project was the gender consistency of the avatar and its adolescent creator (RQ1) and its relationship to their identity styles (RQ3). We found that the vast majority of study participants chose their own gender for the avatars. The differences between girls and boys in choosing a male and female character were statistically significant. These results are in line with those obtained by Au (2007) and Sung et al. (2011), who noted a high gender consistency between the avatar and its creator. The results show that gender is not a feature that adolescents often experiment with in the virtual world. Some people motivate gender swaps by adopting features that are difficult to change/get in real life (Hussain & Griffiths, 2008; Paik & Shi, 2013), but perhaps adolescents focus on the easily changeable ones first. They set life goals, so the effect of possible online experiments should be quickly transferable to the real world. It cannot be ruled out that the relationship between the gender of adolescents and the gender of avatars would be much more complex if a non-binary classification was adopted. However, the avatar creator was based on the traditional definition of femininity and masculinity. The decision to be a boy or a girl resulted in access to a limited repertoire of faces and clothing items dedicated to a given gender. Such limitation of the available options narrows the possibility of experimenting with somebody's virtual representation; however, it is in line with the dominant tendency of game developers. Biocca and Nowak (2002) report that the division into masculine and feminine is even more explicit in cyberspace than in the offline world. The opposite gender was chosen by significantly fewer respondents, while it was found that it was chosen by a greater percentage of girls than boys. Similar results were obtained by Rahill and Sebrechts (2021). Researchers explain the gender swap in women in different ways. According to Hussain and Griffiths (2008), women change their gender more often than men in order to avoid unpleasant behavior in the game. Trepte et al. (2009) postulate that players are more likely to choose their own gender until it begins to affect their effectiveness in the game. Then, the gender that gives better results becomes more important than one's own gender. However, in this study, the avatar's gender did not determine the avatar's

skill level. Study participants could not be guided by such a motive. Therefore, it should be noted that some adolescents change key attributes, such as gender, when creating their virtual representation.

The study did not show any correlation between adolescents' identity styles and gender consistency. Perhaps different strategies of processing self-related information and identity development concern merely the real world and have no reference to virtual representations. On the other hand, they may concern only those aspects of the self that are easily modifiable, so they are not applicable to gender issues. Perhaps adolescents only try out aspects that they will be able to implement later. Yet another possibility is that adolescents use avatars (especially in research) for purposes other than experimenting with their own identities. Perhaps if they played longer, in more neutral conditions, avatars would become a tool for experimenting with crucial aspects of their own identity. It should again be noted that in the computer game *Characterium*, gender was understood only in a traditional, dichotomous way. Nowadays, adolescents face the dilemma of perceiving gender through the prism of traditional gender roles (Stark, 1991) and the contemporary concept of gender equality (Flood et al., 2021). For example, Kamke et al. (2021) found that girls strive for gender equality while still perceiving gender roles in a traditional way. Perhaps there is a relationship between the identity styles of adolescents and gender consistency when the understanding of gender goes beyond binary classification. There is an emerging need to adapt the avatar creation system in a way that does not impose traditional definitions of femininity and masculinity (van Aller, 2018). This is due to the fact that the classical/traditional representation of gender dichotomy limits the possibility of representing one's gender and sexual identity and experimenting with them.

The second issue we investigated in this project was the skin color consistency of the avatar and its adolescent creator (RQ2) and its relationship to their identity styles (RQ4). Almost half of the adolescents chose their own skin color, and the others preferred a different one. This is in line with the results of previous studies, which found that skin color is changed by about half of the players (Rahill & Sebrechts, 2021) or even fewer (Au, 2007; Sung et al., 2011). In terms of gender, we established that almost half of the girls chose their own skin color, while the boys were more experimental. Rahill and Sebrechts (2021) also observed a more frequent change in skin color in men than in women. Such dependence may result from the fact that women usually feel the pressure not to pretend to be someone other than they are while in the virtual world, so they experiment to a lesser extent with various aspects of the self (Ratan et al., 2019). Statistically significant differences concerned the more frequent choice of the first (brighter) color by girls and the more frequent choice of the third (darker) color by boys. It should be noted that the respondents had a choice of four skin colors, while human skin is very diverse in terms of color, and four possibilities of its description may not be sufficient (Jablonski, 2004).

The study did not show any correlation between adolescents' identity styles and skin color consistency. Perhaps, as it was pointed out earlier, in the process of experimenting with one's own identity, those aspects that are easy to modify by adolescents in the real world play an important role. The virtual world sometimes provides a "workspace" to try out what can later be transferred to the offline world (Craig & McInroy, 2014). Skin color is not such a feature that would be easily transferable. Moreover, during this study, adolescents had contact only with a person belonging to the same race. Meanwhile, as shown by Perry (2002), being in the company of people of the same race results in ignoring this feature as an important aspect of one's identity, while the presence of people belonging to other races leads to emphasizing one's own racial and cultural identity. Perhaps the lack of correlation between the identity of adolescents and the consistency of their skin color with the skin color of the avatar is due to the fact that the issue of race was not relevant to them during the study.

Perhaps the analysis of the relationship between avatars and adolescent identity styles should concern the global image of virtual representations and not individual features such as gender or skin color, even if they are crucial to identity. So far, this issue has not been explored by many researchers, but several studies have established that there is a relationship between avatars and the ideal self of their creators (Kim & Sundar, 2012; Lemenager et al., 2020).

Furthermore, more than half of adolescents claimed to play games once a month, less often or not at all. If they do not engage in virtual worlds regularly, there is unlikely to be a stable relationship between their offline and online identities. On the other hand, almost 1/3 of study participants play computer games several times a week or every day. These people may have much more experience with avatar customization. Unfortunately, this study did not analyze experience with virtual reality, which may also influence the development of one's online representation.

Limitations

The *Characterium* game offered limited opportunities to express and experiment with one's identity. First, access to certain items of clothing and hairstyles depended on the gender selected for the avatar, and gender was understood in a traditional way. This means that the people who created the male (female) avatar had little opportunity to make it more feminine (male) (e.g. hairstyles, facial features). Secondly, the subjects had a choice of only four skin colors, while in reality people are characterized by a much more varied range of skin colors (the same objection can be made in regard to the assessment of the study participants' skin color). Thirdly, the adolescents did not describe their motives for maintaining or changing gender and skin color. Such information would certainly facilitate the interpretation of the results. Fourth, the speed of avatar customization was not measured. Such data could be used to analyze how much time adolescents spent on

creating their virtual representation. Study participant who would do it very quickly probably did not care much about their avatar.

Summary

The vast majority of the adolescents attributed their gender to avatars, while the opposite gender was chosen more often by girls than boys. Boys, on the other hand, changed their skin color more often. To some extent, adolescents use avatars as a tool to experiment with their own identity. This is evidenced by the fact that not all avatars were faithful copies of their creators. No relationship was found between adolescent identity styles and gender consistency and skin color consistency. Perhaps this is due to the fact that gender and skin color are features that are difficult to modify in the real world. Therefore, it will not be possible to transfer these changes outside the virtual world, even if they turn out to be beneficial. Perhaps virtual identity should be analyzed more globally rather than only its individual aspects, such as gender and skin color.

In further studies, it would be worth abandoning the traditional understanding of gender and expanding the range of available skin colors. Adolescents should also be asked about the reasons for choosing certain avatar attributes. Thus, it will be possible to more accurately analyze whether there is a relationship between their identity in the real world and the image created in the virtual world.

Compliance with ethical standards: This project received a positive opinion of the Ethics Committee at the Institute of Psychology of the Jagiellonian University. The study was performed in accordance with the ethical standards as set forth in the 1964 Declaration of Helsinki and its later amendments.

DECLARATION OF INTEREST STATEMENT

No conflict of interest

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author, upon reasonable request.

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