

Title	アバタの強弱に関するデザインの印象とネガティブなステレオタイプとの関連
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## Abstract

This paper investigates the relationship between the design impressions of strong / weak anime-like CG avatars and negative stereotypes. This paper consists of six chapters. Chapter 1 provides an overview and definition of avatars, the current state of virtual reality and the metaverse, risks of aggressive behavior and bullying towards avatars, the process of impression formation (stereotypes, prejudice, and discrimination), and the research objectives. Chapter 2 describes the related study and the positioning of this study. Chapter 3 describes the process of avatar modeling and the method of verification. Chapter 4 describes the results of data analysis. Chapter 5 describes a discussion on the results and considerations for preventing risks of aggressive behavior and bullying towards avatars. Chapter 6 summarizes the conclusions of this study.

In recent years, human daily lives have been significantly transformed by the widespread adoption of virtual reality (VR) devices and the burgeoning growth of metaverse platforms. This evolution has led to the extensive utilization of computer graphics (CG) avatars, which serve as digital representations for users. Users can control avatars in both physical and virtual reality spaces (metaverse). Avatars can be categorized into robots and computer graphics types, with the latter further divided into animatic and photorealistic styles. Particularly in Japan, there is a high affinity for anime-like characters, suggesting an increase in communication through anime-like CG avatars. This study utilized the anime-like CG avatars.

Due to the high level of immersion in the metaverse, there are potential risks such as sexual harassment, bullying, and aggressive behavior, similar to reality. Incidents of harassment in the metaverse are on the rise. Avatars with basic designs (non-paid avatars) may be perceived negatively by some users. Additionally, given that bullying and aggressive behaviors towards robots have been confirmed in many countries, it is considered that there are risks even when the entity inside an avatar is not a human, such as a non-player character (NPC) or artificial intelligence (AI). The process of prejudice and discrimination against humanoid avatars might be similar to that against humans. It is important to examine which avatars could potentially be subject to prejudice and discrimination.

This study investigated the relationship between the appearance of avatars and negative stereotypes, based on the theory of physical stereotypes of "Ijime victims (bullying victims)." Avatars with strong and weak features were created to test whether negative stereotypes emerged for each. Specifically, eight avatars were created by combining design elements to represent strong and weak features. These avatars were created using VRoid Studio (Avatar modeling software).

This study used a within-subject design. Avatars were evaluated by 45 participants. The evaluation scales included (1) Impression of avatars (weak to strong impression), (2) Attractiveness of avatars (unattractive to attractive), and (3) The presumption of bullying (victim to perpetrator). The presumption of bullying meant that participants answered whether an avatar was a victim or perpetrator. We use the numerical rating scale (NRS) from 1 to 10 for the evaluation. This study used Google Forms to record participants' responses.

The results reveal that avatars with weak-looking features were evaluated as a weak impression, and those with strong-looking features were evaluated as a strong impression. Therefore, combining the design elements of avatars can elicit specific impressions. Furthermore, this study found a tendency to categorize avatars with weak impressions as bullying victims and avatars with a strong impression as perpetrators. Participants may have judged whether each avatar was a victim or perpetrator based on the strong or weak impressions perceived from the appearance of avatars. Therefore, it is considered that the participants hold negative stereotypes about bullying, which they applied to the avatars. However, whether stereotypes towards avatars lead to prejudice or discrimination requires further verification in future studies. The main findings of this are: (1) specific impressions can be imparted to avatars through the combination of design elements, and (2) the impression of avatars as weak or strong is associated with negative stereotypes. This paper proposes two methods to prevent bullying and aggressive behaviors towards avatars: changing the appearance of avatars and changing users' perspectives. Although changing the appearance of the avatar is the simplest method, it may cause dissatisfaction among some users. In the metaverse, users can use avatars of various appearances. It is not desirable to restrict the use of avatars with weak impressions. Therefore, instead of changing the appearance of avatars, it is essential to change the users' perspective. Several studies have shown that VR perspective-taking is effective in reducing negative stereotypes. By creating VR perspective-taking content that advocates against prejudice (discrimination) based on the appearance of avatars, it is possible to change the perspective of users.

This study demonstrated the emergence of appearance-based bullying stereotypes towards avatars. However, it did not empirically prove that these stereotypes lead to actual bullying behavior. Whether bullying in the metaverse occurs due to appearance-based stereotypes towards avatars requires careful consideration in future research.