



Myself, Reimagined: Users' Perspectives on Authentic Self-Representation Through Avatars in Social Virtual Environments

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Abstract. Avatars are central to how people represent themselves and interact with others in immersive environments such as augmented and virtual reality. This study examines how individuals conceptualize self-representation in social immersive contexts by analyzing open-ended responses from a large online survey ($N = 1,672$). Participants described in their own words what they consider important in avatars intended to represent themselves during social interaction. The study investigates which attributes users value most in self-avatars (RQ1) and how these priorities differ across gender (RQ2) and age groups (RQ3). Responses were coded into predefined categories using a deductively developed codebook and analyzed through qualitative content analysis, complemented by descriptive and inferential statistics. Results show that realism is the most prominent expectation, with approximately 60% of participants emphasizing realistic appearance and similarity, followed by the wishes for avatars that appear friendly and emotionally congruent (26%). Mentions of customization, symbolic identity, and idealization were comparatively rare. Gender differences were minimal overall, with only small variations observed in references to technical aspects of avatar performance (RQ2). Age differences revealed distinct emphases on physical realism versus emotional expressiveness, with younger adults focusing more on appearance and customization, and older adults prioritizing warmth and approachability (RQ3). These findings suggest that authenticity in self-representation is multifaceted, emerging from both visual accuracy and emotional resonance. The study contributes to human-computer interaction and interactive media design by highlighting how diverse user expectations shape understandings of digital selfhood in social immersive environments.

Keywords: Augmented reality · Virtual reality · Avatar · Social interaction · User experience

1 Introduction

Virtual environments, such as those created through virtual reality (VR) and augmented reality (AR), are becoming integral parts of contemporary digital life. Within these environments, users are represented through avatars: graphical digital representations of the self that enable social communication and participation [19]. Avatars can range from simple icons to lifelike human models and play a central role in shaping how people experience presence and identity in mediated communication [27, 34].

As immersive technologies become important arenas for social interaction, from social platforms to professional collaboration settings, understanding what people value in their digital representations becomes increasingly important. Avatars are not only technical artifacts but also designed communication interfaces that influence how users express themselves, perceive others, and engage socially [7]. In this sense, avatar design is not solely a technological challenge but also a social and experiential one, requiring insight into how users define meaningful and authentic digital selves.

To date, much existing research on avatars has focused on system-defined qualities such as visual fidelity, behavioral realism, and technical responsiveness [33]. It showed that higher levels of realism can enhance perceived social presence and trust, while incongruities in form or motion tend to reduce acceptance [1, 44]. However, realism alone does not explain what makes an avatar feel personally meaningful to users. For many, the goal is not simply to reproduce their physical appearance but to express aspects of identity, mood, or style that foster a sense of connection and belonging in social encounters [2, 47]. This shift from system-defined realism to user-defined authenticity presents a key challenge for interactive media design: how to balance technical realism with personal expressiveness and social resonance.

Despite growing interest in avatar research, little is known about how everyday users themselves articulate these expectations when asked openly and without predefined options. While existing studies provide valuable insights into avatar perception and interaction, they often rely on experimental manipulations, structured evaluations, or standardized response formats (e.g., [18, 33, 39, 46]), which limits insight into users' own language, values, and priorities in defining authentic self-representation. A design-oriented perspective that foregrounds open-ended user reflections can help address this shortcoming by translating experiential perspectives into actionable insights for the development of more inclusive, engaging, and emotionally attuned avatar systems.

This study addresses this gap by analyzing open-ended responses from a large online survey in which participants described what they consider important in self-avatars used during social interaction. Rather than focusing only on rendering realism, the study takes a broader view of self-expression, examining how users describe the qualities that make an avatar feel authentic. By translating these reflections into empirically grounded design insights, this study contributes to ongoing discussions in human-computer interaction (HCI) and interactive

media design about how to create avatars that are both technically credible and personally meaningful.

1.1 Avatars as Extensions of the Self

Avatars have long been conceptualized as digital extensions of personal identity, offering users new ways to present and experience themselves [34]. In immersive environments such as AR and VR, this extension becomes embodied: users perceive avatars not only as visual surrogates but as selves-in-action that affect behavior, emotion, and social interaction [12]. The process of avatar creation and selection thus serves as a form of self-presentation [13], where design choices reflect desired impressions, values, and affiliations within a social context.

Previous research shows that self-avatars often blend authentic and idealized components [23]. According to the *Proteus effect* [45], the characteristics of an avatar can influence the user's behavior and self-perception, suggesting that avatar design is not only expressive but also transformative. At the same time, authenticity in digital contexts does not necessarily depend on physical accuracy; it can be achieved through coherence and emotional sincerity rather than literal resemblance [39]. Stylized, symbolic, or even fantastical avatars may therefore be experienced as authentic when they allow users to interact in a way that feels genuine and comfortable.

Beyond serving as identity proxies, avatars also operate as communicative bridges between self and others. Through visual and behavioral cues, they mediate how users project personality, interpret feedback, and negotiate social relationships [10]. The sense of self-extension thus functions on two levels: internally, by reinforcing or exploring one's self-concept, and externally, by shaping how one is perceived within a shared digital space [20,28]. Personal meaningfulness and appropriateness of a self-avatar, therefore, is not determined solely by its appearance but co-constructed through social interaction and mutual perception.

1.2 From Realism to Authenticity

In HCI research, realism—whether in visual fidelity or behavioral responsiveness—has traditionally been treated as a benchmark for quality [1]. High-fidelity avatars are associated with greater immersion, presence, and trust [34,44]. Yet realism can also have drawbacks: excessive fidelity may evoke discomfort, known as the *uncanny valley effect* [29], or limit opportunities for creative self-expression [46]. By contrast, stylized or customizable avatars can create psychological distance that reduces self-consciousness and afford users greater agency to express identity beyond physical likeness, while still enabling meaningful social interaction [3,14].

Recent work has therefore shifted attention from how *real* avatars appear to how *authentic* they feel. This perspective situates avatar design within the broader discourse on digital self-expression [2,34,42], emphasizing that authenticity is not a fixed visual property but a multidimensional experience. It can emerge from resemblance and realism, but also from the ability of an avatar to

convey personality, emotion, and values [10]. Users may perceive an avatar as authentic because it aligns with their sense of self or supports social interactions that feel natural and emotionally sincere. In this view, realism contributes to authenticity only when it facilitates personal or relational coherence, rather than when it merely reproduces external form.

Understanding authenticity in this way means recognizing it as both a perceptual and relational construct. For some users, authenticity reflects coherence between the avatar and their self-image—how accurately it mirrors physical or social identity [43]. For others, it is grounded in the quality of interaction: whether the avatar enables expressive, sincere, and emotionally congruent communication with others [37]. This implies that authenticity does not reside solely in what an avatar looks like, but in how it feels to communicate through it and how effectively it supports empathy, engagement, and social connection. Such perspective underscores that avatar systems should support multiple interpretations of being authentic rather than adhering to a single visual ideal of realism.

1.3 Demographic Dimensions of Self-Representation

Self-expression through avatars also reflects demographic and cultural diversity. These differences appear not only in aesthetic preferences but in how users interpret the social meaning of avatars. Age, for instance, can shape approaches to digital identity: younger users may view avatars as spaces for creativity, experimentation, and humor [17], whereas older adults tend to prefer realistic, recognizable, and emotionally warm representations that maintain continuity with their offline selves [6, 24]. Opportunities for authentic self-representation may decrease with age, as current avatar systems often default to youthful or idealized appearances [30].

Similarly, gender can influence the value placed on visual detail, self-presentation, and stylistic control [11]. Research suggests that women may prioritize aesthetic qualities, idealized appearance, and emotional expressiveness [16, 41], while men are more likely to explore alternative identities or emphasize functionality and self-experimentation [31, 38]. Women may also seek greater resemblance between themselves and their avatars [36], reflecting social expectations of self-consistency. Together, these findings indicate that authenticity in avatar use is socially and demographically situated, influenced by age, gender norms, and the broader context of social interaction [40]. Understanding such variations is essential for designing avatar systems that promote inclusivity, recognition, and comfort across diverse user groups.

1.4 Current Study

Against this background, the present study explores how users describe their expectations for self-avatars in their own words, focusing on social immersive scenarios. It draws on a large-scale dataset of open-ended responses, providing a

user-centered perspective on what makes a digital self feel meaningful or authentic. By foregrounding participants' own language and reflections, the study transforms experiential perspectives into insights that can inform interactive media and avatar design.

Rather than assuming that realism is the primary design goal, the study treats different aspects of visual, emotional, and stylistic self-representation as complementary forms of social self-representation that may coexist or compete in users' preferences. This approach supports a more nuanced understanding of how different dimensions of avatar design contribute to perceived authenticity and social connection.

Accordingly, the study investigates *what attributes users value most in their self-avatars* (RQ1) and how these preferences differ by *gender* (RQ2) and across *different age groups* (younger, middle-aged, and older adults; RQ3).

Through these questions, the study aims to explore how people define an authentic avatar of themselves and how these definitions reflect broader patterns of digital identity and social engagement in immersive environments. In doing so, it contributes empirical design knowledge that bridges user experience (UX) research, self-representation, and interactive media design practice.

2 Methods

This study draws on qualitative data from a large-scale online experiment examining perceptions of avatars in a simulated AR setting for social interaction. In this experiment, administered via an online questionnaire, participants viewed a set of nine pre-created, animated avatars that were gender-matched to the participant and systematically varied along two dimensions: degree of rendering realism (low, medium, high) and age representation (younger, middle-aged, older). Participants evaluated each avatar in terms of its perceived social attractiveness and likelihood to select it for self-representation. Quantitative results from that experiment, which focused on age-related differences in participants' evaluations, have been reported elsewhere [25], where detailed descriptions and visual depictions of the avatar stimuli are provided.

In addition to the experimental task, participants were asked to describe in their own words what they consider important in avatars intended to represent themselves. The present study analyzes responses to that question. Given the open-ended and exploratory nature of the prompt, as well as its placement outside the experimental protocol, it was appropriate to analyze and report these data independently to capture participants' spontaneous reflections on avatar representation, unbounded by predefined response categories.

2.1 Participants and Procedure

Participants were recruited through a professional online access panel provider in Germany. An uncrossed quota sampling approach was employed, with quotas set separately for gender (50% men, 50% women) and age groups (33.3% each

for younger, middle-aged, and older adults). Participation was voluntary and compensated with panel points redeemable for online goods and services.

The online questionnaire was administered in German language via EFS survey from QuestBack Unipark¹ in August 2023. To ensure a shared understanding of avatars in a social context, participants first received a brief explanation with definitions and visual examples illustrating how avatar-mediated communication can take place, following adapted materials previously used in [8, 24]. This introduction provided conceptual clarity and ensured informed consent before participation.

A total of 2,086 participants completed the questionnaire, of whom $N = 1,672$ provided valid open-ended responses analyzed in this study. A comparison between participants who provided a valid open-ended response and those who did not indicated no significant differences across age groups. A small but statistically significant gender difference was observed, with women being more likely than men to answer an open-ended question (Cramér’s $V = .08$).

The average age of respondents was 50.7 years ($SD = 15.9$, range = 18–87), and 52% identified as women (see Table 1).

Table 1. Sample characteristics ($N = 1,672$).

Characteristic	<i>n</i>	%
Gender		
Women	872	52
Men	800	48
Age group		
Younger adults (18–39 years old)	516	31
Middle-aged adults (40–59 years old)	560	33
Older adults (≥ 60 years old)	596	36
Technology competence ^a	3.28	(1.04)
Feelings and attitudes towards the body ^b	4.00	(0.80)

^a M (SD); scale range: 1 (low technology competence) – 5 (high technology competence).

^b M (SD); scale range: 1 (low body satisfaction) – 5 (high body satisfaction).

2.2 Measures

Characteristics of Participants. Participants’ sociodemographic characteristics such as age and gender were obtained from the quota variables used during the sampling process.

¹ www.unipark.com, last accessed on 12.11.2025.

Additionally, their general technology competence was assessed using the Technology Acceptance subscale of the Technology Commitment Scale [32]. The four items (e.g., “I am very curious about new digital developments”) were rated on a 5-point scale from 1 (completely disagree) to 5 (completely agree). Items were averaged into a composite score, with higher scores reflecting higher technological competence. Reliability of the scale was high (Cronbach’s $\alpha = .92$, $GLB = .94$).

To provide context for self-representation, participants completed the Feelings and Attitudes Toward the Body subscale from the Body Investment Scale (BIS; [35]). Six items (e.g., “I am satisfied with my appearance”) were rated on the same 5-point scale, with three reverse-coded items. The composite score showed high reliability (Cronbach’s $\alpha = .90$, $GLB = .93$).

These measures were included to characterize the sample and to provide contextual background for interpreting participants’ reflections on self-representation. They were not incorporated as moderators in the present analysis, as the study focused on qualitative category frequencies and descriptive group comparisons rather than predictive modeling at the participant level.

Open-Ended Question on Self-Avatars. At the end of the questionnaire, the open-ended item invited participants to reflect on what they considered important in avatars representing themselves in social immersive contexts. The exact wording was: “*What is important to you in an avatar that is supposed to represent you?*”. Although participants were introduced to AR as a context for the experimental part of the study, the question was phrased generally and did not reference any specific technology, allowing for broader reflection on avatar-mediated communication. Providing a response to this item was optional.

2.3 Data Analysis

The analysis followed a qualitative content analysis approach [22], supplemented by descriptive and inferential statistics to examine demographic differences.

Codebook Development. The coding framework was developed deductively, informed by established research on avatar design, self-representation, and social interaction in immersive environments. Six main categories were defined: (1) Realistic Appearance, (2) Customization and Style, (3) Expressiveness and Affect, (4) Symbolic and Identity Representation, (5) Idealization and Enhancement, and (6) Technical Quality and Performance. These categories reflect established constructs in avatar and HCI research: visual realism and embodiment fidelity as correlates of presence [18,33], personalization as a form of agency [5], expressiveness as a driver of social connectedness [4,37], identity cues as markers of authenticity and belonging [9,10], idealization as a self-enhancing function of digital representation [23,45], and technical quality as pragmatic aspects that shape usability and comfort in avatar-mediated settings [44]. A deductive approach was chosen because existing frameworks in the literature already describe

key dimensions of user-valued qualities (e.g., realism, customization, expressiveness, identity). The aim was not to generate new theoretical constructs but to apply existing dimensions in the context of self-avatars in social immersive environments.

To ensure conceptual completeness, an additional category (“Other”) was included for responses that did not fit any predefined theme. This category captured meaningful but unanticipated comments and a small subset of statements that could not be interpreted clearly.

The codebook was pretested to ensure its clarity and reliability. Two independent coders coded a random subsample of 200 responses (approximately 12%) using the defined categories. Intercooder reliability was high (average Gwet’s AC1 = .90; 91% agreement). Full reliability statistics and the complete codebook are publicly available on <https://osf.io/dc7fk>.

Data Coding. Following the codebook pretest, all open-ended responses were coded by the first author. Each response was assigned to one primary category, with secondary or tertiary codes applied when participants explicitly mentioned multiple themes within a single comment. Additionally, representative quotations were selected to illustrate the nuances of each category. They were translated from German into English for this publication using the DeepL² translation tool, followed by a quality check by the first author.

Statistical Analyses. To complement the qualitative analysis, descriptive statistics (frequencies and percentages) were calculated to assess the relative frequency of each category. To explore demographic patterns, chi-square tests were performed to compare category distributions across gender and age groups. All statistical analyses were conducted in R (version 4.5.1) using the *dplyr*, *psych*, *gmodels*, and *rstatix* packages.

Because participants could address more than one attribute in a single response, and because these responses were coded into multiple categories where applicable, the resulting category frequencies are not fully independent observations at the participant level. The inferential tests therefore reflect patterns in coded statements rather than independent participant-level measures.

2.4 Ethical Considerations

All participants gave informed consent prior to data collection. No identifying information was stored, and data were analyzed anonymously. The study adhered to the ethical standards of the Declaration of Helsinki and all data collection and processing procedures were compliant with European Union General Data Protection Regulation (GDPR) and relevant German data protection legislation. The study received formal approval by the Ethics Committee of Technische Universität Ilmenau on January 9, 2023.

² <https://www.deepl.com/>, last accessed on 19.11.2025.

The anonymized dataset and materials associated with this study are publicly available on <https://osf.io/dc7fk> to ensure transparency and reproducibility.

3 Results

Across all valid open-ended responses of $N = 1,672$ participants, a total of 1,829 attribute mentions were coded. Because participants often referred to more than one aspect within a single response, in the following sections, results are reported both as the proportion of participants who mentioned each attribute and as the total number of coded attribute mentions.

3.1 Most Valued Attributes in Self-Avatars (RQ1)

To answer RQ1, participants' responses were assigned to six predefined attribute categories. Table 2 summarizes their frequencies, percentages, and representative quotations.

Participants' responses revealed that the most frequently emphasized quality in self-avatars was its realistic appearance, mentioned by 60% of respondents. Most participants stated that avatars should closely resemble themselves in appearance, including facial features, body shape, hairstyle, or aging attributes. Many additionally highlighted that avatars should "look like a real person" and avoid overly stylized or cartoonish designs. Realism was often described as essential for recognizability and meaningful social interaction, as several participants noted that it would feel "strange" or "pointless" to interact with friends through avatars that did not look like them.

The second most commonly mentioned category was Expressiveness and Affect (26%). These responses focused on avatars' ability to display friendliness, warmth, and overall emotional responsiveness. Participants valued avatars that appeared approachable and capable of expressing positive emotions such as smiling or openness, often linking these traits to pleasant social encounters. Many described the avatar's perceived friendliness (e.g., big smile, laugh) as a key determinant of whether they would feel comfortable using it in conversation with others.

Preferences for avatars that can be customized accounted for roughly 8% of responses. Participants in this group valued having creative control over their avatars' design, for example by choosing hairstyles, clothing, or accessories, and by adjusting visual details through customization tools. This included both customizing an avatar overall and having the flexibility to change its elements (e.g., clothing or hairstyle) depending on the mood or time of day. These statements reflected a preference for flexibility and personalization rather than fixed, system-defined appearances.

Another 8% of responses fell under Symbolic and Identity Representation category, referring to the avatar's ability to represent one's inner characteristics, attitudes, or lifestyle. Participants emphasized that the avatar should reflect one's character or worldview, either through visual or behavioral attributes or

Table 2. Most important attributes in self-avatars mentioned by $N = 1,672$ participants, sorted by prevalence. Percentages are rounded and indicate the proportion of participants who mentioned each attribute. A total of 1,829 attribute mentions were identified due to multiple mentions per participant. Example quotes are annotated as (participant gender, age in years), with F = female and M = male.

Category	Description	Example quotes	<i>n</i>	%
Realistic Appearance	The avatar should look natural, human-like, and resemble the user's real-world appearance.	"He should look like me. Otherwise, it doesn't make sense to use it with friends or relatives." (F, 33) "It should look as much like me as possible, especially the face. Of course, the body shape and clothing should also match me, but the face is most important." (M, 46)	996	60
Expressiveness and Affect	The avatar should express emotions and behaviors that make it feel lively and engaging.	"I want to be portrayed as approachable, open, ready to talk, and friendly." (F, 78) "It should have a friendly face. After all, you'd only use it when talking with nice people." (F, 39)	442	26
Customization and Style	Users value the ability to personalize and creatively adjust their avatar's look or style to match individual taste or context.	"I'd like to have the option to create the avatar myself from a preset selection or toolkit, so I can change the clothing and accessories depending on my mood that day." (F, 50) "You should be able to adjust facial features using sliders. Not just choose from, say, five different noses, but fine-tune the size and shape precisely." (M, 31)	136	8
Symbolic and Identity Representation	The avatar should represent the user's identity, personality, or background.	"It should appear neither too young nor too old (because even though I'm older, I'm very youthful, open, and curious)." (F, 69) "It would need to reflect my personality in some way—things like humor, helpfulness, tolerance, empathy, intelligence, and interests." (M, 76)	128	8
Idealization and Enhancement	The avatar should reflect an idealized, aspirational version of the user.	"It should not make me appear less likeable, but rather portray me as better or more positive than I am." (M, 71) "It should look good and not have the things that bother me about myself." (F, 26)	58	3
Technical Quality and Performance	The avatar should function smoothly and reliably.	"It needs to protect my privacy." (M, 47) "Not like something from a 1990s computer game." (F, 33)	41	2
Other	Unspecific responses.	"It could be Donald Duck for all I care." (M, 69)	28	2

both. Mentions of age realism were also found in this category, in cases when age was associated with one’s self-concept and interpersonal image.

Smaller proportions of responses addressed the idealization and enhancement of avatars (3%) and their technical quality and performance (2%). Only a few participants described wanting avatars that represent an improved version of themselves (e.g., appearing younger, more attractive, or more confident), while still being recognizable. Mentions of technical attributes referred mainly to functional aspects such as responsiveness, motion quality, or privacy and protection of personal data during avatar-mediated interaction.

The remaining 2% of responses were categorized as “Other”, typically representing broad or ambiguous statements. As this category did not produce any additional meaningful attributes and was not part of the theoretical coding framework, it was omitted from the gender and age comparisons that follow.

Overall, these results show that participants primarily valued self-avatars that are realistic, expressive, and recognizable, while aesthetic customization, symbolic identity cues, and idealization played a more limited role in their descriptions.

3.2 Gender Differences in Valued Self-Avatar Attributes (RQ2)

To answer RQ2, chi-square tests were conducted to examine whether the distribution of response categories differed between women and men. As shown in Table 3, both women and men mentioned the Realistic Appearance category most frequently (60% of all women and 59% of all men) and Technical Quality category least frequently (2% of all women and 3% of all men).

Table 3. Gender differences in valued self-avatar attributes among $N = 1,672$ participants, sorted by overall prevalence. Percentages are rounded and indicate the proportion of participants within each group who mentioned the attribute. Totals exceed N because multiple attributes could be mentioned. The residual category “Other” was excluded from this analysis. Cramér’s V is reported as the effect size.

Category	Total ($N = 1,672$)	Women ($n = 872$)		Men ($n = 800$)		$\chi^2(1)$	p	V
		n	%	n	%			
Realistic Appearance	996	527	60	469	59	0.57	.45	.02
Expressiveness and Affect	442	242	28	200	25	1.62	.20	.03
Customization and Style	136	76	9	60	8	0.82	.36	.02
Symbolic and Identity Representation	128	61	7	67	8	1.12	.29	.02
Idealization and Enhancement	58	32	4	26	3	0.22	.64	.01
Technical Quality	41	15	2	26	3	4.08	.04	.05

A statistically significant difference was observed only for Technical Quality and Performance category, $\chi^2(1) = 4.08, p = .04$, although the effect size was negligible ($V = .05$). For all other categories, no significant gender differences were found.

3.3 Age Differences in Valued Self-Avatar Attributes (RQ3)

Regarding RQ3, chi-square tests were conducted to examine differences across three age groups: younger adults, middle-aged adults, and older adults (see Table 4).

A significant difference was found for Realistic Appearance category, $\chi^2(2) = 17.24, p < .001, V = .10$, with younger adults mentioning this aspect most frequently (66%), followed by middle-aged (61%) and older adults (54%). Significant differences were also observed for Expressiveness and Affect category, $\chi^2(2) = 51.99, p < .001, V = .18$, with older adults (36%) mentioning this aspect more often than middle-aged (26%) and younger participants (16%).

Further significant differences appeared for Customization and Style category, $\chi^2(2) = 11.34, p < .01$, and Technical Quality and Performance category, $\chi^2(2) = 11.37, p < .01$. For both categories, younger adults reported these aspects more frequently than the other two age groups; however, the effect sizes were negligible ($V = .08$ for both categories).

Table 4. Age differences in valued self-avatar attributes among $N = 1,672$ participants, sorted by overall prevalence. Percentages are rounded and indicate the proportion of participants within each age group who mentioned the attribute. Totals exceed N due to multiple mentions. The residual category “Other” was excluded from this analysis. Cramér’s V is reported as the effect size. Younger adults: 18–39 years; middle-aged adults: 40–59 years; older adults: ≥ 60 years.

Category	Total ($N = 1,672$)	Younger adults ($n = 516$)		Middle-aged adults ($n = 560$)		Older adults ($n = 596$)		$\chi^2(2)$	p	V
		n	%	n	%	n	%			
Realistic Appearance	996	339	66	338	60	319	54	17.24	<.001	.10
Expressiveness and Affect	442	85	16	145	26	212	36	51.99	<.001	.18
Customization and Style	136	56	11	48	9	32	5	11.34	<.01	.08
Symbolic and Identity Representation	128	32	6	44	8	52	9	2.54	.28	.04
Idealization and Enhancement	58	22	4	20	4	16	3	2.09	.35	.04
Technical Quality	41	22	4	12	2	7	1	11.37	<.01	.08

4 Discussion

This study examined what users value in self-avatars designed for social contexts and how these preferences vary by gender and age, based on a large, age-diverse online sample of adults in Germany ($N = 1,672$). The findings contribute to a growing body of work in HCI and interactive media design that views avatars not merely as technical renderings but as experiential and communicative interfaces. Users' responses revealed that authenticity in self-avatars is understood in multiple ways: for some, it reflects physical recognizability, while for others, it stems from emotional and social expressiveness. Together, these insights underline the multidimensional nature of perceived authenticity and demonstrate that meaningful self-representation in immersive environments is shaped as much by emotional and social resonance as by visual fidelity.

4.1 Most Valued Attributes in Self-Avatars

Across the dataset, realistic appearance emerged as the most frequently mentioned attribute, emphasizing that visual resemblance to one's real self remains central to credible and comfortable social interaction. Participants often stated that avatars should look like them, suggesting that realism serves as a baseline expectation in social settings rather than a stylistic choice. This finding supports prior research identifying realism as a foundation for social presence and trust [44]. However, participants' interpretations of realism varied: some referred to detailed physical similarity, such as facial features or body shape, while others described realism more broadly, using terms like human-likeness or general recognizability. This diversity illustrates that realism is not a purely technical parameter but a perceptual and contextual construct, and its meaning may depend on users' goals and the social situations in which avatars are used.

The second most salient category of attributes related to the expressiveness and affect, highlighting that authenticity in avatars extends beyond physical likeness. Participants valued avatars that appeared friendly, smiling, or approachable, often describing these traits as essential for comfortable communication. These results suggest that emotional readability and warmth are critical to social believability, echoing research that links affective expressiveness to perceptions of sincerity and engagement in avatar-mediated communication [4, 37, 39]. For older adults in particular, friendliness and warmth were recurring motifs, indicating that emotional resonance may become more central to self-representation with age [24]. This finding aligns with existing evidence that older adults tend to prioritize socio-emotional meaning and comfort over visual precision in digital interaction [26].

Other attributes such as customization, identity cues, and idealization were less frequent but revealed important nuances. Participants who wished to have creative control over aspects of their avatars, such as clothing or hairstyle, typically preferred customization within limits that maintained recognizability. This balance between individual expression and social continuity highlights that self-avatars are both personal and relational: they are designed not only for self-

expression but also for being seen by others. However, mentions of idealization were rare, suggesting that participants generally sought avatars that reflected their real selves, even if slightly customized, rather than heavily altered or aspirational versions. This pattern may be partly attributed to their generally high reported body satisfaction ($M = 4.00$ on a scale from 1–5). When individuals already feel positively about their appearance, they may be less motivated to pursue idealized representations and instead prioritize avatars that feel familiar. It is also possible that the social context of this study further reduced the inclination toward idealization; in other, less socially anchored contexts (e.g., gaming), preferences for idealized avatars might be stronger [15, 21].

Technical quality of avatars was seldom mentioned, suggesting that users primarily associate them with social identity and communication rather than with system performance. The relative absence of technical concerns further supports the idea that users conceptualize avatars as expressive and social entities rather than as technological outputs. On the other hand, it may also reflect the generally moderate to high level of self-reported technology competence in the sample ($M = 3.28$ on a scale from 1–5), which could have led participants to take basic technical functionality for granted rather than foregrounding it in their descriptions.

Gender differences in participants' responses were minimal, pointing to largely shared expectations between men and women. This can be interpreted as evidence that core principles of self-representation, such as the desire for recognizability, comfort, and expressiveness, are relatively universal across genders, at least within the social contexts examined. It may also indicate that as avatar use becomes more common in digital communication, gendered patterns of digital self-presentation begin to converge, reflecting shared norms of authenticity and social presence. By contrast, age differences were more pronounced: younger participants placed greater emphasis on physical realism and customization, whereas older adults prioritized friendliness and emotional warmth. These differences suggest that age shapes not only aesthetic preferences but also the underlying motivations of avatar use—whether avatars serve as vehicles for self-exploration and experimentation or as mediums for establishing deeper connection and recognition [6, 30].

Taken together, the findings indicate that authenticity in self-representation is not a singular construct but a flexible, multidimensional one. Users define authenticity through both recognizability and expressiveness, seeking avatars that feel socially credible, emotionally attuned, and personally meaningful.

4.2 Design Implications

The data in this study were collected within a simulated social AR framework; however, the prominence of realism and expressiveness as the main determinants of authenticity is consistent with broader findings from research on social VR and general virtual environments [1, 34]. This suggests that user expectations for self-avatars likely transcend specific technologies, providing valuable guidance for the design of immersive communication systems more generally.

One key implication is that realism should not be treated as synonymous with authenticity. While users clearly value visual recognizability, emotional readability and social comfort are equally essential. Designers should therefore prioritize avatars that not only look plausible but also feel engaging and capable of conveying friendliness, warmth, and emotional responsiveness. This can be achieved through the implementation of subtle cues such as gaze direction, facial expressions, or gestures.

A second implication concerns the importance of layered personalization. Participants valued the ability to adjust stylistic elements of their avatars without compromising recognizability. This indicates that design systems should support structured customization, allowing users to maintain consistent identity traits (such as facial structure or age markers) while flexibly modifying surface attributes like clothing, colors, or hairstyles. Layered personalization enables individuality without eroding social continuity, an essential quality for avatars used in repeated interactions or professional contexts.

Equally important is preserving user agency. Authenticity in digital self-representation is not simply a matter of technical accuracy but of subjective alignment. This means that users must be able to decide what feels *right* for them. Systems should therefore accommodate both faithful and expressive modes of self-representation, enabling users to choose between realism, stylization, or emotional expressiveness depending on context and preference.

Another important design implication pertains to age inclusivity. Many participants emphasized that their avatars should reflect their real age, while only few wished to appear younger. This finding points to a current limitation in avatar design, where youthful templates still dominate [25,30]. Incorporating age-diverse models and subtle age cues such as skin texture, hair color variation, or posture can foster recognition and comfort among older adults, enhancing inclusivity across the lifespan.

Finally, age sensitivity should also extend to the overall design philosophy. Younger users may approach avatars as creative tools for experimentation, while older adults may seek clarity, familiarity, and emotional warmth. Adaptive interfaces can reflect these differing priorities by simplifying customization or enhancing affective expressiveness, thus ensuring that immersive communication remains inclusive, socially resonant, and emotionally meaningful across generations.

Overall, the study contributes to the design-oriented understanding of avatars by empirically demonstrating that authenticity is not a single aesthetic or technical goal but a multidimensional construct combining realism, expressiveness, and personal relevance. Effective avatars in social immersive environments are those that enable users to feel both recognizable and emotionally present, bridging the gap between technological fidelity and lived social experience.

5 Limitations and Outlook

Several limitations should be acknowledged when interpreting the findings of this study.

First, the data were collected within an experimental study that presented participants with several pre-created avatars. Although the open-ended question about self-avatars was intentionally broad and not embedded within the experimental evaluation task, participants' responses may nonetheless have been influenced by the preceding exposure to these stimuli. In particular, this could have directed participants' attention toward certain features, such as realism or recognizability, while discouraging others, such as playfulness or creativity.

Second, while the large sample size enabled a reliable overview of recurring priorities, the brevity of responses limited the interpretive depth typically attainable through qualitative research. Moreover, self-reported data are inherently subjective and can reflect social desirability or limited self-reflection rather than deliberate design reasoning.

Third, the sample was limited in terms of diversity. Gender was recorded only in binary form (male/female), which restricts the ability to examine gender identity as a broader and more fluid construct. In addition, all data were collected from adults residing in Germany, which limits the cultural generalizability of the results. Cultural norms surrounding appearance, identity, and digital self-presentation may differ substantially across societies, and future studies should explore whether similar patterns hold in more diverse or cross-cultural samples.

Fourth, because the data were collected in an AR simulation, participants' responses may have been subtly shaped by this framing. However, given the general phrasing of the question and the conceptual overlap between AR and VR in social contexts, the findings are likely to extend to social virtual environments more broadly.

Looking forward, future research should complement this large-scale survey approach with richer qualitative methods, such as in-depth interviews or participatory design workshops, to better capture users' motivations and reasoning behind specific preferences. Experimental studies with prototype avatars could also help validate whether verbalized expectations align with actual UX in immersive environments. Moreover, interaction effects between gender and age were not examined in the present study, and future work could explore whether specific gender-age constellations reveal distinct patterns of self-avatar preferences. Combining these approaches would enable a more holistic understanding of what makes self-avatars feel authentic across contexts, cultures, and generations.

6 Conclusion

This study provides large-scale, user-centered evidence on what users value in self-avatars within social immersive environments. By analyzing $N = 1,672$ open-ended responses, it highlights that users' sense of authentic self-representation through avatars is grounded not only in visual realism but also in emotional expressiveness and recognizability. Across gender and age groups, realism emerged as a baseline expectation, while expressiveness, particularly among older adults, underscored the social and relational nature of avatar use.

The study extends existing HCI research by shifting attention from *system-defined metrics* such as fidelity or presence to *user-defined meanings* of authenticity and representation. It shows that users interpret authenticity in diverse ways, balancing the desire to look like themselves with the wish to feel socially connected and emotionally understood.

For designers and developers, the findings emphasize that successful avatar systems should not aim for realism alone but should support layered personalization, allowing users to choose between faithful and expressive forms of self-representation. It shows that realism and expressiveness are not competing goals but complementary design dimensions that jointly shape meaningful self-representation. By centering users' voices, the study provides a foundation for designing avatar systems that are not only technically advanced but socially and emotionally resonant.

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