

Digital Clones and Avatars: A Decade of Psychological and Behavioral Research (2015–2025)

Introduction:

Digital **avatars** – virtual representations of users – and more advanced **digital clones** (autonomous AI-based agents modeled on a real person) have become prevalent in therapy, education, and social interaction over the past decade. Researchers have explored how using an avatar of oneself (whether a real-time controlled avatar in virtual reality or an AI-driven “clone” that acts independently) influences psychological states and behavior. Key theoretical frameworks (e.g. the *Proteus effect* and self-identity theories) guide this work, and methodologies range from controlled lab experiments and randomized trials to qualitative studies in real-world virtual communities. Below, we review notable findings in three domains – **therapeutic**, **educational**, and **social** applications – highlighting outcomes, frameworks, ethical considerations, benefits, and potential drawbacks in each domain.

Therapeutic Applications of Self-Avatars

Mental Health Interventions with Avatars

Using avatars of oneself or personal entities has opened new therapeutic avenues for mental health. One prominent example is “**avatar therapy**” for psychosis: patients who hear distressing voices create a digital avatar embodying the voice and engage in guided dialogue with it. In a 2024 randomized controlled trial with 345 participants, this avatar-based therapy (added to standard care) significantly reduced voice-related distress at a 16-week follow-up compared to treatment as usual ¹ ². Patients essentially “talk” to the visualized avatar of their hallucinated voice, which can be moderated by a therapist. While effects on distress and voice severity were strong in the short term, they had diminished by 28 weeks ², suggesting the need for sustained or repeated interventions. Notably, no serious adverse events were reported ³, indicating the approach is generally safe when properly supervised. This therapy draws on a framework of **externalization** (giving the hallucinated part of self a face and form) and **cognitive-behavioral principles**, enabling patients to confront and gain control over their symptoms in a controlled virtual environment. Other studies have echoed positive outcomes: a 2017 trial found **avatar therapy** led to reductions in frequency and severity of voices for many patients, with qualitative reports of patients feeling “empowered” by standing up to their avatar persecutors ¹ ². This line of research illustrates how avatars can serve as therapeutic proxies for aspects of self or illness, facilitating novel “face-to-face” dialogues that were impossible before digital technology.

Another innovative use is employing **self-avatars for depression and self-compassion** training. In one program, patients embody two avatars in sequence: first a compassionate counselor, then themselves. For example, a patient in VR sees a virtual child (representing their inner self) and practices delivering comforting words; next, they switch perspectives into the child avatar and *receive* those same comforting messages from a virtual “clone” of themselves ⁴. An open trial of this method (15 patients with

depression) found that just three short VR sessions led to significant decreases in depression severity and self-criticism, and increased self-compassion by a 4-week follow-up ⁵. Four of the 15 patients showed clinically significant improvement ⁶. These results suggest that **immersive perspective-taking** with one's own avatar can enhance emotional resilience. The theoretical foundation comes from *compassion-focused therapy* and the concept of **embodiment** – by viewing and treating one's avatar with kindness, patients alter their self-to-self relationship. A 2023 systematic review of 19 studies (672 participants) on VR self-compassion interventions supports these findings, showing that virtual reality can indeed reduce self-criticism while boosting self-compassion and protective feelings toward oneself ⁷. This demonstrates the growing evidence that **avatars as digital “self mirrors”** can promote mental well-being.

Beyond mental health, **avatars and digital self-models are used for behavior change and rehabilitation**. For instance, in **physical health and exercise therapy**, researchers have studied the *Proteus effect* (explained below) among older adults to encourage fitness. In one study with 104 elderly participants, individuals who exercised in VR while seeing a youthful avatar of themselves were more motivated – especially older women, who reported higher self-efficacy for future exercise and actually engaged in more physical activity – compared to those given an avatar matching their real older age ⁸ ⁹. The younger self-avatar essentially inspired them to put in greater effort, as evidenced by greater perceived exertion and movement intensity among these participants ¹⁰ ⁸. This suggests that an **idealized self-avatar (e.g. a younger, fitter version)** can positively influence health behaviors in therapeutic settings. The theoretical mechanism is the Proteus effect and self-perception change: embodying a more capable version of oneself activates matching behavioral schemas (e.g. “I am more able-bodied”) ¹¹ ¹². Similarly, clinical VR programs have used personalized avatars for stroke or motor rehabilitation – patients can watch a virtual “twin” perform exercises or receive real-time biofeedback via an avatar, which increases engagement and adherence. Though results vary, many programs report improved motor function and motivation when patients see their avatar successfully performing target movements (leveraging **visual self-modeling** as a form of vicarious reinforcement). Overall, using one's digital likeness in therapy – whether to confront a hallucinated entity, practice compassion, or motivate healthy behavior – has shown **measurable benefits across multiple studies** in the past decade.

Autonomous Digital Clones in Therapy and Ethical Considerations

Most therapeutic avatar applications so far involve **real-time control or therapist mediation**, but emerging cases use more autonomous digital clones. For example, **AI-driven virtual coaches or counselors** can replicate certain aspects of a patient or therapist. In experimental settings, virtual therapists embodied as avatars (not the patient, but as digital humans) have delivered cognitive-behavioral therapy or conducted intake interviews. While these aren't clones of the patient, they highlight how autonomous agents in avatar form can engage users therapeutically. Initial trials (circa 2015–2020) found that some patients open up more to a non-judgmental avatar therapist, and such systems can reliably detect mental health cues, but their *clinical efficacy* is still under study. A related frontier is **“griefbots”** or digital clones of deceased loved ones used in bereavement therapy. Early case reports and a 2025 letter in a medical journal discuss how people are now able to converse with AI chatbots made to imitate deceased family members ¹³. These services claim to provide therapeutic benefits – allowing users to process grief by talking to a familiar avatar – but they raise thorny ethical issues ¹³. The creation of a posthumous digital clone often involves mining the deceased's personal data (social media posts, recordings) without explicit consent ¹³. This **violates privacy and dignity** in the eyes of many ethicists. Researchers have highlighted the need for **posthumous consent mechanisms and regulatory oversight** if such clones are to be used in mental health care ¹⁴ ¹⁵. There is also concern that interacting with a lifelike digital proxy of a loved one

might **complicate the grieving process** – for example, making it harder to accept the loss (by “keeping them alive” digitally) ¹⁶ . To date, psychological outcomes of griefbot use are largely anecdotal, and experts urge caution until more empirical research is done ¹⁷ ¹⁶ .

Ethical considerations in therapeutic use of avatars/clones also include ensuring patient safety and agency. Therapists must carefully facilitate avatar dialogues to avoid causing undue distress – e.g. confronting a hallucination via an avatar can be intense, so protocols include constant support and the ability for the patient to control or alter the avatar’s appearance/voice. In the psychosis avatar therapy RCT, for instance, patients had a say in designing the avatar representing their persecutory voice (often choosing a face to match their imagination of it) and could gradually assert more control over the conversation, guided by the therapist ¹ . Transparency is another concern: clients should always know whether they are interacting with a human-controlled avatar or a fully autonomous AI. In sum, therapeutic research over the last decade indicates **significant benefits** of using self-avatars – including symptom reduction (e.g. less hallucination distress), improved emotional self-compassion, and increased motivation – while also underscoring the need for ethical safeguards, long-term follow-ups, and clarity about the nature of these digital “selves.”

Key takeaway: In therapy, avatars of oneself can serve as powerful tools to externalize internal conflicts, practice new coping skills, and motivate behavior change. They leverage psychological mechanisms like embodiment and self-modeling, with controlled studies showing promising outcomes (e.g. reduced symptoms of psychosis ¹ ² and depression ⁵). The approach is generally well-received and safe, though sustained efficacy and ethical issues (consent, identity integrity, emotional side-effects) require further research.

Educational Applications of Avatars and Digital Clones

Enhancing Engagement and Learning through Immersive Avatars

In education, the use of student avatars and virtual environments has grown, especially with the rise of remote and digital learning platforms. Avatars allow learners to **embody a presence in virtual classrooms or simulations**, which can increase engagement and interactivity. A 2025 review on avatars in the “educational metaverse” noted that avatars enable students to participate in realistic scenarios, collaborate in groups, and develop skills via role-play in ways that traditional methods cannot ¹⁸ ¹⁹ . For example, science classes have used VR avatars to let students virtually perform lab experiments or explore environments (like walking through an ancient historical site or inside the human body) which enhances experiential learning. These individualized avatar experiences have been linked to higher student **participation and achievement** by making learning more immersive ¹⁸ . Studies consistently find that such environments boost student motivation and *cognitive engagement*, often measured by time on task and knowledge retention. Theoretical frameworks here include **constructivist learning** (students learn by doing in context) and **situated learning** – avatars place students *inside* the learning scenario, providing context that aids understanding and memory.

One key to success is the **personalization and adaptability** of avatars. Modern educational avatars can be powered by AI to adapt to a learner’s progress, providing real-time feedback or adjusting difficulty ²⁰ ²¹ . For instance, intelligent tutor systems now use avatar-based agents that respond to student emotional cues or performance (thanks to natural language processing and affect detection) ²² ²³ . This makes learning more interactive: the avatar might offer hints if the student is struggling or pose harder questions if the

student is excelling. Such adaptivity, combined with a visual/social presence, has been shown to increase both **effectiveness and enjoyment** of learning ²⁴ ²⁵ . Importantly, avatars that closely mimic human behaviors (using gestures, facial expressions, etc.) can foster a sense of *social presence* in virtual learning, making interactions feel more “real.” Research suggests that when an avatar instructor or peer reacts and looks more human-like, students report greater connection and emotional engagement ²⁶ . However, designers must beware of the “**uncanny valley**” – if an avatar is *almost* realistic but slightly off, it may actually cause discomfort and reduce engagement ²⁷ . One review pointed out that attempting perfect human likeness can backfire; technical limitations (stiff expressions, lag) might undermine the intended sense of immersion and lead to psychological distancing ²⁷ . Thus, finding the right balance in avatar realism and providing options for students to customize their avatars to their comfort is crucial.

Avatar Identity and Student Motivation

Educational outcomes can also be influenced by the **type of avatar identity** a student adopts. A fascinating finding in recent years is that avatars representing a student’s **actual self** tend to yield better academic outcomes than avatars representing an idealized or future self. In a 2022 field experiment with 170 undergraduates, students were randomly assigned either an avatar closely resembling their real appearance, an avatar of their “ideal” self (e.g. improved looks or traits), or a “future” self (aged to look older and wiser). Surprisingly, the group using **actual-self avatars outperformed** the others: they had slightly higher exam scores and self-efficacy in the course, whereas those with idealized or future avatars saw lower scores and confidence ²⁸ . No difference was found in growth mindset across groups, but the drop in performance for idealized avatars suggests a possible **self-discrepancy effect** ²⁸ . Researchers theorized that when a student’s avatar is too aspirational (not matching their real self), it might create a subtle disconnect or pressure that hinders learning – the student may not identify as strongly with the avatar or may feel discouraged by the gap between their real and ideal self ²⁸ . In contrast, an avatar that looks like *you* can reinforce your identity (“this is me in the learning environment”) and thereby increase presence and confidence. This aligns with broader avatar research showing users experience more **presence and attachment** when their avatar aligns with their own self-perception ²⁹ . In educational contexts, higher presence can translate to better focus and persistence on tasks.

Additionally, studies on **avatar customization** show that giving students control to personalize their avatars (within educational platforms or games) boosts their intrinsic motivation. It provides a sense of ownership and agency, which according to Self-Determination Theory supports greater engagement. However, guidance may be needed: if students focus excessively on “idealizing” their avatar’s appearance, it could introduce self-image concerns. The 2022 study above implies that encouraging students to design avatars that reflect their authentic selves (rather than an unattainable ideal) might be more beneficial for learning outcomes ²⁸ . This is a nuanced insight for instructional designers incorporating gamification: while avatars and game-like elements can improve **engagement and enjoyment**, the orientation of the avatar (actual vs. ideal self) can subtly shape performance. Future research is examining whether this effect holds in younger students and different cultural contexts, and what the psychological mediators are (e.g. perhaps actual-self avatars enhance self-efficacy or reduce anxiety in academic tasks).

Virtual Role-Play, Training Simulations, and Professional Education

One of the most impactful uses of avatars in education has been in **simulation-based training** for complex skills. Avatars allow learners to participate in realistic role-playing scenarios that would be impractical or unsafe to replicate in real life. For example, medical schools use patient avatars in virtual hospitals to train

students in diagnosis and bedside manner. A medical student can interview and examine a virtual patient (often controlled by AI or an instructor behind the scenes), allowing them to practice clinical reasoning and communication. This kind of *case-based learning* via avatars lets students make mistakes and learn from them without real-world consequences. Research in medical education finds that these simulations improve **critical thinking and confidence**, aligning with the principles of experiential learning ³⁰ ³¹. Similarly, in **teacher education**, avatars have been used to create virtual classrooms filled with avatar “students” of varying ages and behaviors. Trainee teachers can step into this virtual classroom (often via mixed reality setups like Mursion/TeachLivE) and practice managing a class, delivering lessons, and responding to challenging student behaviors. Such **avatar-mediated teaching practice** has yielded impressive results: studies show that practicing in a simulator significantly improved new teachers’ classroom management skills and self-assurance before they face real students ³² ³³. In these systems, the student avatars may be controlled by humans (to simulate realistic interactions in real time), or semi-autonomous, responding with programmed behaviors. Trainees report that the avatars feel authentic enough that they experience stress and problem-solving similar to a real classroom, which helps transfer skills to real life. One review noted that by creating **realistic and engaging scenarios**, avatar-based simulations helped educators develop problem-solving and decision-making skills, and were shown to “*significantly improve engagement and learning outcomes*” in participants ³³.

Beyond education professionals, many industries are adopting **avatar-based training**: for instance, customer service training with virtual customers, military or emergency response drills in virtual environments, and public speaking training where one addresses a virtual audience. In all these cases, one’s avatar (or digital presence) is involved in the simulation. Public speaking anxiety, for example, can be reduced by practicing speeches in front of a virtual crowd; the avatar representing the user can even be programmed to display anxiety cues (like trembling) that the user learns to control. The **methodologies** in these studies are often quasi-experimental: e.g. measuring performance improvements from pre- to post-simulation, or comparing a group with avatar training to a group with traditional training. Consistently, **avatar-based practice** tends to yield equal or better outcomes than traditional training, with the added benefits of safety, cost-effectiveness, and the ability to repeat scenarios with consistent conditions. Theoretical support comes from *social cognitive theory* (learning by doing and feedback) and *situated learning*. Participants often report high **presence** in these simulations – they feel truly “in” the scenario – which can enhance the emotional and cognitive aspects of learning.

It’s worth noting that **autonomous digital clones** in education (AI-driven avatars that teach or learn on behalf of a student) are still an emerging area. One could imagine an AI clone of a student that, for example, practices skills 24/7 in a simulation and then coaches the student, but this remains largely speculative. More common are AI **tutor avatars** or **chatbots** that personalize instruction. Advances in natural language processing have made these agents more responsive and lifelike ³⁴. Recent developments (2023–2025) integrate generative AI to create avatars that can *demonstrate* tasks or explain concepts dynamically. For instance, a student might ask a question in a virtual lab, and an AI avatar (perhaps modeled after a famous scientist or a personalized mentor figure) can provide an on-the-fly explanation. Early studies indicate these AI avatars can boost **learning outcomes and engagement** if designed well ²⁴ ³⁵. However, challenges like ensuring accuracy of AI-provided information and maintaining student trust are significant.

Ethical and practical considerations in educational avatars revolve around access, privacy, and developmental impact. Implementing avatar-rich environments requires infrastructure – high-speed internet, VR equipment – which might not be equitably available (raising issues of digital divide) ³⁶. Data

privacy is crucial since such systems may collect personal data (motion, voice, facial expressions) to drive the avatars; protecting this data and being transparent about its use is essential ³⁶. There are also open questions about the long-term effects of extensive avatar use on children's development of identity and social skills – does interacting via avatars hinder or help real-world social abilities? Educators generally see avatars as a supplement, not a replacement, for in-person interaction. The consensus from the past decade of research is that, when used thoughtfully, avatars and virtual worlds can **enhance learning experiences, increase engagement, and improve skill acquisition**, from early education through professional training ³² ³³. They offer safe spaces to practice and personalized pathways to knowledge. Yet, educators are advised to be mindful of the design (promoting authenticity over unattainable ideals in avatars) and to address the logistical and ethical issues accompanying these technologies.

Key takeaway: In education, avatars serve as mediators of immersive learning – they make remote or abstract learning more concrete and social. Research has shown improved outcomes in student engagement, performance, and skill mastery when avatars are used for interactive simulations and personalized learning ³² ³³. Students tend to benefit most when their avatars reflect their real identity (supporting presence and confidence) ²⁸. Major benefits include increased motivation, the ability to safely explore scenarios, and adaptive instruction, while challenges include ensuring equitable access, respecting privacy, and avoiding designs that inadvertently reduce learning (e.g. overly idealized avatars or creepy pseudo-humans).

Social Applications and Impacts of Avatars/Digital Clones

Identity, Self-Presentation, and the Proteus Effect in Social Avatars

In social and recreational contexts, avatars have become a means for self-expression and identity exploration. **Social Virtual Reality (VR)** platforms (e.g. VRChat, AltspaceVR) and online worlds (e.g. Second Life, gaming communities) allow people to interact via avatars. Research over the last decade shows that users often choose avatars that **align closely with their identity or desired identity**, and this choice affects their virtual experience. A study of social VR users found that people who used avatars resembling their real selves felt **heightened presence and attachment** – they felt “more there” and more connected – compared to those using very different avatars ²⁹. This heightened presence can lead to more natural social interactions and greater emotional investment in the virtual community. On the other hand, using an avatar drastically different from oneself (different gender, fantastical creature, etc.) can be liberating for some but may also introduce *identity discrepancy*. The **Virtual Identity Discrepancy** framework suggests that large mismatches between one's real self and avatar (e.g. a shy person using a bold, extroverted avatar) might create internal tension or reduced coherence in social presence. Empirical findings are mixed: some users report feeling *freer* and more confident under the mask of an avatar, even if it's unlike them, while others feel disconnected if the avatar is too far from their self-image.

One of the most cited theories in avatar research is the **Proteus Effect**, introduced by Yee and Bailenson (2007). This effect refers to how **people tend to conform to the characteristics of their avatar's appearance or identity**. In simpler terms, *your avatar can shape how you behave* ³⁷ ³⁸. Over 60 studies have documented this phenomenon, with a recent meta-analysis confirming a reliable, if moderate, effect size (around $r = 0.24$) ³⁹. Classic experiments showed that if someone's avatar is taller, more attractive, or dressed professionally, the user becomes more confident and assertive in virtual interactions – and sometimes even in subsequent face-to-face behavior ⁴⁰ ⁴¹. For example, participants given a tall avatar in a negotiation game negotiated more aggressively and stuck for better deals than those given a shorter

avatar ⁴² . They carried that assertiveness into a real-world negotiation afterward ⁴³ ⁴⁴ . This illustrates how *embodiment* in a digital body can alter one's self-perception and behavior through mechanisms like self-perception theory, priming, or schema activation ¹² ⁴⁵ . On the positive side, the Proteus effect means avatars can be used to encourage **pro-social or healthy behavior** – e.g. embodying a fit avatar could motivate one to exercise more, or an avatar of a different ethnicity could reduce implicit bias by enhancing empathy. Studies have indeed used avatars to foster empathy by having users experience life as someone of another race, gender, or ability status, often leading to increased understanding and reduced prejudice in the short term. However, the Proteus effect also has a **darker side**: if the avatar's identity cues encourage negative behaviors or stereotypes, users might conform to those as well. A 2024 study extended Proteus research to *anti-social outcomes*, showing that male participants who embodied a hypermasculine, aggressive avatar (modeled after a sports team mascot) were quicker to perform a misogynistic act in VR (in this case, an inappropriate touch of a female avatar) – effectively, the avatar's macho identity lowered their inhibitions for transgressive behavior ⁴⁶ ⁴⁷ . Interestingly, the study found nuances in how avatar design influenced behavior (factors like body size and group association played a role) ⁴⁸ , but broadly it suggests that **avatars tied to certain group identities or stereotypes can induce conformity to those norms**, even if they are negative (e.g. aggression, toxicity) ⁴⁹ .

The Proteus effect and related findings underscore a key point: **digital self-representation is not “just play” – it can feedback into one's attitudes and actions**. This has led to increased attention on *avatar design ethics*: for instance, should platforms discourage overly sexualized or violent avatar representations if they might encourage harmful behavior? How can we empower users to choose avatars that bring out their best selves? Some platforms attempt to provide default avatars that are neutral or diverse to avoid pushing any single stereotype. The research community continues to explore how long-lasting these behavior changes are (most lab studies only measure immediate effects) and what individual differences (e.g. personality, identification with avatar) moderate the Proteus effect.

Social Interaction, Relationships, and Community Dynamics

Avatars are the vehicles of **social interaction** in virtual spaces, and studies show that they enable rich, meaningful connections, but also come with unique social challenges. On the positive side, social VR can reproduce many of the nuances of face-to-face communication – gestures, voice tone, spatial presence – leading to **“natural” interaction behaviors** that text-based chat or traditional social media lack ⁵⁰ . One experiment found that people interacting in a social VR environment (with voice and full-body avatars) behaved very similarly to how people interact in person, maintaining interpersonal distance, eye contact (when avatars show gaze), and turn-taking, etc. It concluded that *social VR elicits natural interaction behavior and can be used for anonymous face-to-face style interactions without the usual negative side-effects of text anonymity* (like flaming) ⁵⁰ . In other words, meeting someone's avatar in VR can feel much more like meeting the person than an anonymous text username would, which can encourage civility and genuine connection. Users often report strong feelings of **social presence** – the sense that others are truly there with you – in avatar-mediated communication. During the COVID-19 pandemic, for example, some people used VR hangouts to replicate gatherings and found it more engaging than video calls, because moving around a virtual space with avatars gave a sense of *shared space* that Zoom grids could not.

Avatars also allow individuals to **form friendships and communities** beyond geographical limits. Virtual worlds have thriving communities where people attend events, play games, or simply “hang out” as avatars. Psychological outcomes of these interactions are generally positive: participants often experience **reduced loneliness** and increased social support, especially those who have difficulty with face-to-face socializing

(such as individuals with certain disabilities or social anxiety). For instance, studies have looked at older adults using social VR to combat isolation – in one project, older participants used a custom social VR platform and reported enjoying the sense of **co-presence** and the ability to perform activities together (like virtual tai chi classes or attending a virtual museum) without leaving home ⁵¹ ⁵². The challenges here tend to be technological (ease of use) and educational (comfort with avatars), but once over the learning curve, many older users embraced avatars as a fun way to connect. Similarly, autistic young adults have utilized avatar-based social platforms to practice social skills in a less pressured setting; preliminary research indicates some improvement in social competence and confidence when they later interact in person, suggesting a **translational benefit** of virtual practice.

However, social avatar use is not without **drawbacks and ethical issues**. **Harassment and virtual aggression** can occur – unfortunately, just as in real life or any online forum. What’s unique in VR is that harassment can feel alarmingly *real*. If someone’s avatar is touched inappropriately or encroached upon, the user can experience visceral discomfort or trauma, because their embodied perspective tricks the brain into reacting as though their real body was violated. As one paper noted, *harassment toward one’s avatar can equate to harassment toward oneself*, given the blurred boundary between avatar and self in immersive environments ⁵³. This has led to calls for robust moderation and personal boundary settings (many VR platforms now allow a personal “bubble” to prevent others from coming too close). Additionally, the **psychological impact of avatar abuse** is an emerging research area – early evidence suggests that victims of virtual harassment can feel real anxiety and stress, so the social norms and protections in these spaces are crucial.

Another issue is **identity deception and privacy**. Since avatars can be highly customizable, people can misrepresent themselves (e.g. an adult posing as a teen, or using someone else’s photos to make a lookalike avatar). As realistic “digital human” avatar technology improves, it raises the risk of **identity theft** in virtual settings. A 2022 review highlighted that personalized avatars bearing a user’s real likeness, while enhancing authenticity and trust in interactions, could be misused – *“how do we know whether the avatars we encounter are who they claim to be?”* ⁵⁴. If someone copies another’s digital appearance (a form of deepfake), it could lead to fraud or defamation in the metaverse. The review found a severe lack of robust identity verification methods in current social VR platforms ⁵⁵. It emphasized that safeguarding users’ identity and privacy (through, say, authentication badges, encryption, etc.) is **crucial for the future of social VR** ⁵⁴ ⁵⁶. Ethically, there is a tension between allowing anonymity (which can encourage free self-expression and privacy) and preventing malicious impersonation. Designers are exploring solutions like verified avatar profiles or blockchain-based identity management to address this.

Avatar-mediated socialization also intersects with **diversity and inclusion**. Research shows that not all users experience virtual worlds equally. For example, one study on Black users in VRChat found that they face **“racialized avatar experiences”** – default avatar options often cater to white or light-skinned characters, requiring extra effort for Black users to create avatars that represent their race ⁵⁷. Participants reported instances of bias, such as other users’ insensitive comments about their avatar’s appearance, and noted they sometimes take on the *“burden”* of educating others or code-switching their avatars in certain spaces ⁵⁷ ⁵⁸. The study also showed that when there was a big discrepancy between a Black user’s real appearance and their chosen avatar (due to limited options), it **negatively affected their sense of presence and embodiment** in VR ⁵⁹. Essentially, if you can’t properly represent yourself, you feel less “there” and less connected. This highlights the importance of diverse avatar customization options (skin tones, hair textures, cultural attire, etc.) to allow all users to create authentic digital selves. It’s an ethical imperative and also a factor in the psychological comfort of users.

Finally, the line between **virtual relationships and real relationships** is an interesting psychological question. Many people form genuine friendships or even romantic relationships through avatars. Studies on “VR dating” or long-distance relationships via avatars show that high levels of intimacy and satisfaction are possible, especially when avatars convey rich nonverbal cues and partners engage in shared activities. Some couples report that interacting in VR (as opposed to just texting or calling) made them feel like they were *together* in a meaningful way, which reduced loneliness. That said, there can be *identity surprises* (if someone hasn’t revealed their true appearance or other aspects) when relationships move from virtual to physical.

Benefits vs. drawbacks summary: On the whole, social use of avatars offers **tremendous benefits**: expanded social networks, novel forms of entertainment (e.g. attending live concerts as avatars), identity exploration (people can try out different genders or fantastical forms in ways that can be self-expressive or just playful), and even mental health benefits (support communities in VR for anxiety, LGBTQ youth finding a safe space to express their true identity via avatars, etc.). People have reported boosts in self-esteem from positive feedback on their avatars and enjoyment from creative self-stylization. The **drawbacks** include the potential for disinhibition (while the Proteus effect can encourage positive behavior, anonymity can also remove accountability leading some to troll), harassment that can deeply affect users, and the aforementioned identity/privacy risks. Additionally, excessive use of virtual worlds raises concerns about *addiction* or *escapism*, though evidence is mixed on how prevalent problematic use is. Balancing virtual life and real life is a personal challenge some face if the avatar world becomes more fulfilling than reality. Psychologists note that, similar to heavy online gaming, heavy engagement with avatar worlds can sometimes interfere with offline responsibilities or relationships, but for most users avatars are just one aspect of their social life.

Key takeaway: In **social contexts**, avatars and digital clones are not mere fantasy – they actively shape how we communicate and who we become in virtual spaces. Research from 2015–2025 illustrates that users often project their identities into avatars and even take on traits from them (the Proteus effect), influencing confidence, behavior, and social presence ³⁸ ⁴² . Avatars can enhance social connectedness, allowing naturalistic interactions across distance and fostering communities, which is beneficial for many groups (from isolated seniors to marginalized youth). At the same time, they introduce challenges around identity authenticity, harassment, and equality of representation ⁵⁴ ⁵⁶ . The psychological and behavioral outcomes are complex – avatars can empower and enrich social life, but also require new norms and safeguards to ensure virtual environments are safe and inclusive.

Conclusion

Over the past ten years, the use of self-avatars and digital clones has moved from intriguing experiments to practical applications with real impact. **Therapeutically**, we now have evidence that interacting with avatars of oneself (or facets of oneself) can alleviate symptoms and promote positive behavior change, leveraging immersion and self-reflection in ways traditional therapy cannot ¹ ⁵ . **Educationally**, avatars are enriching learning experiences by making them interactive and personalized, helping learners engage more deeply and practice skills in realistic virtual contexts ³² ³³ . **Socially**, avatars are redefining how we connect, offering new opportunities for expression and interaction, while also posing new questions about identity and human behavior in mediated worlds ²⁹ ⁴⁸ . Across these domains, key theoretical frameworks like the Proteus effect remind us that the **alterations in digital self-representation have measurable psychological consequences**, often aligning with established social psychology principles (e.g. self-perception, identity theory). Methodologically, research has ranged from controlled trials and experiments

to qualitative interviews, indicating a maturing field that triangulates quantitative outcomes (e.g. exam scores, symptom scales, behavior frequencies) with rich user experiences and perspectives.

Ethical considerations thread through all domains: ensuring that digital clones are used with consent and respect, safeguarding user data and identity, and mitigating any negative effects on individuals' mental health or development. There is also an overarching societal question as AI-based autonomous clones advance – for example, if one can have an AI clone attend meetings or socialize on one's behalf, what does that mean for authenticity and human agency? While such scenarios are just emerging, researchers are already calling for “*trustworthy, human-centered XR*” design principles to guide the next generation of avatar and clone technology ⁶⁰ ⁶¹ .

In summary, the psychological and behavioral research of the last decade paints a picture of **avatars and digital self-clones as powerful double-edged tools**. When designed and applied thoughtfully, they can enhance well-being, learning, and social connectedness – patients mastering their fears by talking to their own avatar, students immersing themselves in learning with a personalized virtual presence, friends separated by miles feeling virtually together. The benefits are tied to core human processes: identification, embodiment, and social presence. Yet, these same tools can amplify undesirable behaviors or create new risks if misused – an avatar can encourage aggression as easily as empathy, and a clone of one's identity can be misappropriated just as it can be empowering. The next decade will no doubt see deeper exploration of these themes, with researchers and practitioners collaborating to maximize the **therapeutic, educational, and social gains** of avatar technology while minimizing its pitfalls. The lessons from 2015–2025 provide a crucial foundation for that journey, highlighting both the promise and the need for prudence when leveraging digital versions of ourselves.

Sources:

- Avatar therapy in psychosis (Nature Medicine, 2024): *AVATAR therapy involves voice-hearers engaging in a series of facilitated dialogues with a digital embodiment of the distressing voice* ¹ ; showed reduced voice-related distress at 16 weeks vs. treatment as usual ² .
- VR self-compassion for depression (BJPsych Open, 2016): 8-minute scenario switching between giving and receiving compassion via avatars led to *significant reductions in depression severity and self-criticism* and increased self-compassion at 4 weeks ⁵ ⁴ .
- Systematic review of VR for self-compassion (2023): VR interventions (19 studies, 672 participants) *enhanced self-compassion and self-protection while reducing self-criticism*, with potential to improve depression management ⁷ .
- Proteus effect definition and examples: People tend to *conform behaviorally to their avatars' identity characteristics* ³⁸ – e.g. *participants playing as taller avatars behaved more assertively* in negotiations ⁴² . Meta-analyses find a small-to-medium overall effect ($r \approx 0.24$) across 60+ studies ³⁹ .
- Educational avatar study (Computers & Education, 2022): A field experiment found using an **actual-self avatar** (vs. ideal or future self) was associated with *higher exam scores and self-efficacy* in an undergraduate course ²⁸ .
- “Avatars in the educational metaverse” review (2025): Avatars enable *realistic scenarios, group work, and personalized learning* in virtual environments, improving engagement and achievement, though issues of *data security, ethical concerns, and infrastructure* remain ¹⁸ ¹⁹ . It also notes **virtual classroom simulations** have *significantly improved engagement and learning outcomes* in teacher training ³³ .

- Social VR identity & privacy review (Front. Virtual Reality, 2022): Personalized avatars with users' likeness can enhance authenticity but *pose privacy/identity risks like impersonation*. Protecting users from identity theft and verifying avatars are urgent challenges for social VR ⁵⁴ ⁵⁶ .
- Social VR user behavior: Users commonly choose avatars aligning with their self-image and *experience greater presence and attachment* with those avatars ²⁹ . Harassment toward one's avatar often *feels like real harassment*, blurring the line between virtual and real abuse ⁵³ , which raises the need for safety measures in immersive social platforms.

¹ ² ³ Digital AVATAR therapy for distressing voices in psychosis: the phase 2/3 AVATAR2 trial | Nature Medicine

https://www.nature.com/articles/s41591-024-03252-8?error=cookies_not_supported&code=48fe74fd-bcab-42be-91c3-86716abbabaa

⁴ ⁵ ⁶ Embodying self-compassion within virtual reality and its effects on patients with depression - PubMed

<https://pubmed.ncbi.nlm.nih.gov/27703757/>

⁷ (PDF) The Effects of Virtual Reality on Enhancement of Self-Compassion and Self-Protection, and Reduction of Self-Criticism: A Systematic Review

https://www.researchgate.net/publication/367987956_The_Effects_of_Virtual_Reality_on_Enhancement_of_Self-Compassion_and_Self-Protection_and_Reduction_of_Self-Criticism_A_Systematic_Review

⁸ ⁹ ¹⁰ ¹¹ ¹² ⁴³ ⁴⁴ ⁴⁵ ⁵² Exercising With Embodied Young Avatars: How Young vs. Older Avatars in Virtual Reality Affect Perceived Exertion and Physical Activity Among Male and Female Elderly Individuals - PMC

<https://pmc.ncbi.nlm.nih.gov/articles/PMC8572814/>

¹³ ¹⁴ ¹⁵ Digital clones of the deceased in mental health care: Promises and perils - PMC

<https://pmc.ncbi.nlm.nih.gov/articles/PMC12034995/>

¹⁶ Digital afterlife: Will your AI self outlive you—and what does that ...

<https://www.psypost.org/digital-afterlife-will-your-ai-self-outlive-you-and-what-does-that-mean/>

¹⁷ The Psychological Effects of AI Clones and Deepfakes

<https://www.psychologytoday.com/us/blog/urban-survival/202401/the-psychological-effects-of-ai-clones-and-deepfakes>

¹⁸ ¹⁹ ²⁰ ²¹ ²² ²³ ²⁴ ²⁵ ²⁶ ²⁷ ³⁰ ³¹ ³² ³³ ³⁴ ³⁵ ³⁶ Avatars in the educational metaverse | Visual Computing for Industry, Biomedicine, and Art | Full Text

<https://vciba.springeropen.com/articles/10.1186/s42492-025-00196-9>

²⁸ Avatar customization orientation and undergraduate-course Outcomes:Actual-self avatars are better than ideal-self and future-self avatars | Request PDF

https://www.researchgate.net/publication/363644027_Avatar_customization_orientation_and_undergraduate-course_OutcomesActual-self_avatars_are_better_than_ideal-self_and_future-self_avatars

²⁹ ⁵³ Body, Avatar, and Me: The Presentation and Perception of Self in Social Virtual Reality | Request PDF

https://www.researchgate.net/publication/348256857_Body_Avatar_and_Me_The_Presentation_and_Perception_of_Self_in_Social_Virtual_Reality

³⁷ ⁴⁰ ⁴¹ ⁴² The Proteus Effect: How Your Avatar Shapes You

<https://www.news.viverse.com/post/how-does-your-avatar-shape-you-discussing-the-proteus-effect-and-the-impact-of-digital-identities-o>

38 39 46 47 48 49 Examining the Proteus effect on misogynistic behavior induced by a sports mascot avatar in virtual reality | Scientific Reports

https://www.nature.com/articles/s41598-024-70450-2?error=cookies_not_supported&code=bd69ffb9-af96-4ea6-aae9-e4756faadb6f

50 Social virtual reality elicits natural interaction behavior with self ...

<https://www.sciencedirect.com/science/article/pii/S107158192500045X>

51 Using Immersive Virtual Reality to Enhance Social Interaction ...

<https://pubmed.ncbi.nlm.nih.gov/37213325/>

54 55 56 60 61 Frontiers | Digital body, identity and privacy in social virtual reality: A systematic review

<https://www.frontiersin.org/journals/virtual-reality/articles/10.3389/frvir.2022.974652/full>

57 58 59 Black immersive virtuality: Racialized experiences of avatar embodiment and customization among Black users in social VR | Virtual Human Interaction Lab

<https://vhil.stanford.edu/publications/avatars-and-agents/black-immersive-virtuality-racialized-experiences-avatar-embodiment>