

"Similar-Self" vs. "Alt-Self": How Avatar Customization Impacts Trust Formation in Social VR and Its Transfer to Face-to-Face between Unacquainted Individuals

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Figure 1: (a) Two participants in the “Alt-Self” condition engaged in the VR interaction using highly stylized avatars during the ice-breaker and structured conversation. (b) Two participants in the “Similar-Self” condition interacted in VR using self-resembling avatars while completing the same conversational tasks. (c) The same interaction procedure was repeated in the physical environment during the subsequent face-to-face meeting.

Abstract

This study investigates how avatar customization in virtual reality (VR) impacts trust formation between unacquainted individuals and how such trust transfers to subsequent face-to-face (FtF) meetings. A user study with 48 participants was conducted, where participants were assigned to either a “Similar-Self” condition, with avatars resembling their real-world appearance, or an “Alt-Self”

condition, with creative avatars. The results showed that “Similar-Self” avatars led to higher initial integrity-based trust perceptions, though both avatar conditions exhibited similar trust growth during VR encounters. Trust carried over from VR to FtF with a brief recalibration period and ultimately increased beyond VR levels in FtF encounters. This research provides insights into how VR can support the development of trust in early-stage interactions and offers implications for Social VR platforms to better support trustworthy interactions across virtual-physical boundaries.

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• **Human-centered computing** → **Empirical studies in collaborative and social computing.**

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1 Introduction

As Virtual Reality (VR) technology has developed, social VR platforms such as VRChat, Meta Horizon, and RecRoom are rapidly expanding in use [96, 115, 152]. Unlike conventional computer-mediated communication (CMC) such as email, video conferencing, and messaging apps, social VR enables embodied, real-time engagement through fully customizable avatars and shared environment [99, 109], allowing users to engage in vivid spatial and temporal experiences and a range of emotional states similar to FtF interactions [51]. These affordances have made social VR an emerging tool for facilitating relationship building [50, 62], professional meetings [6], and collaborative work [46, 73, 116]. As more of such interactions begin in VR and later transition in-person, early online encounters can shape users' expectations and impressions prior to first-time face-to-face (FtF) meetings [146, 152]. With social VR increasingly becoming an entry point for interpersonal engagement, understanding how it shapes trust, a crucial factor in fostering human connection and collaboration in both virtual and physical spaces, remains important yet underexplored [15, 22, 56, 85, 147].

Trust, broadly understood as the willingness to rely on another party [97, 114], is a foundational element in building meaningful connections across both in virtual and real-world contexts. In the virtual environment, the process of forming trust is particularly complicated because interaction is mediated through avatars instead of direct, FtF interactions [107]. Previous research shows that avatars play a central role in shaping interpersonal perceptions in social VR, influencing users' sense of social presence, evaluations of trustworthiness, and overall communication satisfaction [8, 107, 153]. Avatars act as the primary cue for first impressions, much like physical appearance in FtF interactions. The extent to which avatars reflect a user's real-world appearance or represent idealized or alternative versions directly affects how others perceive them and influences the initial formation of trust [41, 51, 104]. Since users often interact as "unacquainted individuals" with concealed identities, which are referred to as "strangers" in prior works, avatar customization becomes a key factor in reducing uncertainty and shaping trustworthiness during early interactions [98]. Understanding how avatar customization influences trust in social VR, and whether such impressions persist or transform during subsequent FtF encounters, is therefore critical for explaining how trust develops across the virtual-physical boundary.

While prior research [5, 46] has shown that unacquainted individuals can form connections in social VR, the nuances of how trust

established in social VR transfers to FtF interactions remain an understudied topic. Studies on trust development in CMC [22] emphasize the gradual nature of trust formation and erosion over time, but there is limited understanding of the trust translation dynamics, the ways in which trust formed in VR persists or changes when individuals meet in person. Most studies on trust in VR [53, 54, 118, 131, 156] have focused on interactions with virtual agents or scripted avatars, rather than genuine human exchanges. These gaps motivate this work to investigate how organically formed trust in social VR can be transferred to FtF encounters, a crucial aspect for designing applications that foster long-term, meaningful relationships both in virtual and real-world contexts.

In this paper, we conducted a mixed-methods study to examine how avatar customization influences trust formation between unacquainted participants in social VR and its subsequent translation from VR to FtF contexts. In this study, we define "**unacquainted individuals**" as *individuals who have had no prior interaction or contact with one another in any context*. We especially focus on them because understanding how trust is initially formed in VR among unacquainted individuals and subsequently transferred to FtF interactions is essential for designing future social VR systems that foster genuine and more satisfying social interactions across online-offline boundaries. In doing so, we aim to address two research questions:

- RQ1: How does avatar customization ("Similar-Self" vs "Alt-Self") during an initial VR encounter affect participants' development of trust toward an unacquainted individual?
- RQ2: To what extent does trust established through avatar-mediated VR interactions transfer to subsequent face-to-face meetings?

Specifically, 48 participants who were unacquainted with each other were randomly assigned to one of two avatar customization conditions: a "Similar-Self" condition featuring self-resembling avatars with actual voice or, an "Alt-Self" condition featuring creatively designed avatars paired with a voice-changing tool. We then investigated whether avatar-driven first impressions shaped levels of trust formation during initial VR encounters. In the VR phase, participants engaged in dyadic interactions, performing a 3-minute ice-breaker followed by a 7-minute structured conversation. The same activities were conducted during the subsequent FtF phase to investigate whether these VR-initiated bonds could be carried over when participants met FtF for the first time.

This work offers preliminary insights into how VR relationships can evolve into real-world connections. These include: (1) it adds to existing research on online trust formation by illustrating how avatar customization can shape first impressions and influence initial judgment in social VR; (2) it contributes to understand online-offline trust dynamics by examining how trust formed in human-human VR interactions transfer to FtF encounters; and (3) it demonstrates how trust formed through avatar-mediated interactions are recalibrated, reinforced, or weakened during the VR-to-FtF transition, offering implications for Social VR systems that aim to facilitate meaningful interpersonal connections both within VR and beyond.

2 Related Work

In this section, we review existing research on interpersonal trust formation and avatar-mediated interactions in VR to position the present study within broader theoretical and empirical contexts. Specifically, we review: (1) how trust develops in Virtual and FtF contexts, with an emphasis on methods for measuring trust; (2) the importance of trust formation in social VR mediated interpersonal relationships; and (3) the role of avatar customization, focusing on appearance and voice, in shaping first impressions, self-presentation, and trust.

2.1 Understanding and Measuring Trust in Virtual and FtF Contexts

In FtF contexts, interpersonal trust often emerges rapidly through a combination of verbal exchange, shared situational context [102, 103, 117], and rich non-verbal cues [25, 75, 82]. Social Penetration Theory posits that relationships develop through a progression from superficial to more intimate levels of disclosure [138]. This gradual increase in depth and reciprocity provides partners with diagnostic cues that help them infer reliability and form interpersonal trust. Similarly, Uncertainty Reduction Theory argues that early interactions between unacquainted individuals revolve around reducing cognitive and behavioral uncertainty [29]. Through mutual questioning, behavioral consistency, or sharing personal information, individuals become more confident in assessing each other's intentions, thereby making it easier to build trust.

Meanwhile, observable non-verbal behaviors, such as eye contact [20], posture [57], facial expressions [25, 90, 134], and vocal dynamics [43, 105] provide continuous, synchronous feedback that supports judgments of sincerity and trustworthiness. These cues can accelerate in short-term or high-pressure settings, with trust forming quickly based on positive expectations [48, 101], first impressions [155], and shared goals [33]. Synchronous communication and a strong sense of social presence further reinforce this process [80, 140].

As an increasing number of interpersonal relationships are initiated through CMC such as text messaging, voice calls, and video conferencing [123], trust development faces structural constraints due to reduced cue bandwidth. Early research by Rocco found that trust was more difficult to establish in CMC than FtF [112], and previous studies pointed to several limitations, including the loss of rich non-verbal cues [81, 141], reduced immediacy and synchronicity of feedback [142], attenuated emotional nuance [26, 39], and fewer contextual signals for interpreting intent [67, 143]. To compensate, individuals often rely on incremental self-disclosure and extended interaction over time [143], yet trust still develops more slowly and remains fragile compared to FtF contexts [22, 159].

To study how trust develops across different interaction modalities, previous studies adopted two complementary measurements: survey-based and behavioral approaches. Both methods are widely validated and used in studies of trust in virtual and FtF contexts [13, 85, 132]. Common instruments for measuring subjective trust include the Interpersonal Trust Scale (ITS) [113], General Trust Scale (GTS) [150], and Kurzskaal Interpersonales Vertrauen (KUSIV3) [12], which primarily assess generalized trust rather than context-specific dynamics. To capture trust in virtual settings, Bente

et al. introduced a 20-item scale for avatar-based collaboration [15], and subsequent work has adapted existing trust models to develop tailored questionnaires for specific research objectives [9, 53, 87]. Sometimes, survey-reported trust can be biased, especially in VR where identities may be ambiguous or artificially constructed [51]. Besides, to complement these subjective measures, researchers often employ behavioral paradigms such as the *Trust Game* (also known as the *Investment Game*), in which a participant's investment reflects their willingness to accept vulnerability and thus operationalizes interpersonal trust, while the partner's return decision reflects trustworthiness [13, 16, 35, 132]. Because the Trust Game captures risk-taking and reciprocity in dyadic exchanges, it is widely used to examine trust formation in short-term interactions similar to those in our VR–FtF setting. Additionally, ask–endorse methods offer a complementary behavioral measure of trust through endorsement-based decisions [86].

To summarize, trust in FtF contexts develops through rich verbal and non-verbal cues, whereas in virtual settings reduced bandwidth can slow and fragment this process. In social VR, where identity is flexible and cues are technologically mediated, trust assessment must consider avatar design, voice modulation, and spatial behavior. As interactions increasingly span virtual and physical settings, prior work suggests that trust judgments may need to be renegotiated when individuals move between contexts where different identity cues, risks, and social expectations become salient [154]. Capturing these dynamics can be challenging with existing measures. This study contributes by adapting a mixed-methods design that combines Likert-scale surveys and a behavioral trust game across both VR and FtF contexts, offering methodological insights into how trust can be more effectively measured and understood in hybrid environments.

2.2 The Importance of Trust Formation in Social VR Mediated Interpersonal Relationships

Social VR has emerged as a new form of CMC and offers immersive, real-time interactions through embodied avatars in shared virtual environments [98, 99, 109]. By enabling proxemics, gaze, head movement, and gestures, social VR reintroduces non-verbal cues that are largely absent in conventional CMC [3, 31, 92] and fosters a heightened sense of embodied social presence [27, 100, 125]. These affordances allow users to engage in ways that feel more natural and socially rich, supporting deeper mutual understanding and relational connection. Previous research shows that such embodied interactions in social VR can foster meaningful connections, highlighting its potential to trust formation and relationship building [5, 11, 46, 50, 145].

As these interactions increasingly extend beyond the virtual environment, an important question is whether trust established through avatar-mediated encounters persists or transforms when individuals later meet FtF, with implications for both theory and system design [133]. At the same time, trust formation in social VR is uniquely challenging due to the ambiguity introduced by avatar-mediated embodiment. While embodied interaction can enhance mutual understanding during shared tasks [55, 127], the flexibility of avatar customization obscures stable identity cues and complicates assessments of authenticity and reliability [52, 88].

Avatars may be realistic, idealized, or fantastical, and each variation shapes perceptions of authenticity and trustworthiness in distinct ways [151]. Realistic or self-resembling avatars are often interpreted as more authentic and accountable, which can foster interpersonal trust by signaling sincerity and reducing ambiguity about the user’s intentions [119]. In contrast, idealized avatars may generate more positive impressions but can also raise doubts about self-presentation accuracy or behavioral consistency [64]. Fantastical or highly stylized avatars introduce uncertainty because they provide fewer cues about the person’s real identity, making it harder for partners to infer reliability or predict behavior [51]. These differences in identity signaling directly influence how quickly and confidently users form trust during first encounters in social VR.

Mismatches between visual appearance and voice can lead to social incongruence, such as when a calm voice is paired with a threatening avatar, disrupting impression formation and reducing perceived trustworthiness [32, 149]. Moreover, the absence of detailed facial expressions and subtle movements can further limit people’s ability to accurately interpret sincerity and emotions [3, 130]. Because trust is highly sensitive to these dynamics, understanding how it is built and maintained in social VR and beyond is important for fostering positive interactions and sustainable virtual communities.

Trust between unacquainted individuals in social VR often develops across structured stages. Knapp’s relational stage model describes how relationships escalate through initiating, experimenting, and intensifying stages, moving from first impressions to deeper self-disclosure and commitment [49]. HCI research has similarly identified three stages for supporting interactions: browsing, ice-breaking, and supported conversation [78]. In unfamiliar, avatar-mediated settings, these stages are especially critical for calibrating trust through consistent verbal behavior and mutual responsiveness [145]. To facilitate this progression, researchers have proposed social strategies such as guided self-disclosure prompts [136], structured dialogue frameworks [66], and collaborative micro-activities that foster joint agency [137]. The widely adopted Fast Friends protocol fosters rapport by using structured, progressively intimate questions that encourage self-disclosure and mutual sharing [7], it has been validated as an effective framework for building trust and connection within time-limited interactions across VR and FtF contexts [4, 66, 70, 126, 157].

Despite growing attention to trust-building strategies in mediated environments, existing research often focuses on group collaboration or assumes relatively stable identity cues. In social VR, identity (including appearance, voice and behavior) is malleable, trust must be continuously interpreted through constrained non-verbal signals and unfamiliar visual representation. Building on prior frameworks, the present study embeds the Fast Friends protocol within a controlled social VR setting to investigate how avatar-based self-presentation and structured interaction scaffolds influence early trust formation between unacquainted individuals and whether the trust established in VR can carry over into subsequent FtF interactions.

2.3 The Role of Avatar Customization in Shaping First Impressions and Trust

In avatar-mediated environments like social VR, visual appearance serves as a primary cue for social judgment before verbal interaction [135]. These early judgments are not merely momentary impressions; rather, avatar-based self-presentation can crystallize into an initial “virtual trust image,” through which first impressions formed in VR may extend beyond the virtual encounter and be revisited in subsequent FtF interactions [89]. Similar to attire or body language in FtF settings, avatars convey implicit signals about personality, status, and intent [129]. The Proteus Effect suggests that avatars influence both users’ behavior and others’ responses [151]. For example, avatars perceived as attractive or similar tend to elicit more positive first impressions and higher levels of trust [64, 119]. In contrast, dissimilar, highly stylized, or ambiguous avatars can hinder identification and foster social distance [68, 70, 76]. This dynamic creates an inherent tension between strategic self-presentation and authentic identity signaling [65].

Beyond visuals, voice also conveys rich personal information and plays a critical role in establishing an avatar’s identity by providing emotional nuance, cultural cues, and signals sincerity [74, 94]. In VR, voice often remains the primary channel of self-expression, particularly when facial expressions and subtle non-verbal cues are limited [42]. Building on this, Dominic Kao et al. explored whether voice customization can have effects comparable to visual customization, finding that the integration of coherent visual and vocal cues can foster more open and trusting communication [71]. Prior works also emphasized the importance of believable voices, noting that mismatches between an avatar’s voice and appearance can create discomfort and undermine perceived authenticity [30, 32]. These findings highlight the complex role of voice in social VR: it functions both as an authenticity anchor and a tool for anonymity [71, 105], complicating trust formation and prompting users to continually adjust their perceptions as new cues are revealed [36].

Taken as a whole, avatar customization can shape trust formation by influencing how users interpret identity, authenticity, and social intent during early encounters in social VR. Visual appearance establishes initial expectations related to similarity, approachability, and credibility, while voice contributes emotional and behavioral consistency. When appearance and voice align, users experience greater confidence in their trust judgments; when they diverge, ambiguity and uncertainty increase. If trust formed in social VR is expected to inform later FtF interaction, avatar design choices may have consequences extending beyond the virtual setting [21]. In this light, the interplay of visual and auditory cues provides a foundation for early trust evaluations, highlighting the importance of considering both avatar appearance and voice when examining how trust develops in avatar-mediated interactions and how these impressions may influence subsequent FtF encounters.

3 User study

To address our research questions, we conducted a user study, which has one between-subjects factor: *Avatar Customization Condition* (“Similar-Self”, “Alt-Self”); and one within-subjects factor: *Interaction Stage* (Pre-VR, Post-VR, Pre-FtF, Post-FtF, Follow-up). These five stages reflect participants’ transitions across the three contexts (VR,

FtF, Follow-up). Dyads (a pair of two unacquainted participants) were randomly assigned to one of the two avatar customization conditions, and all dyads experienced both contexts in a fixed order, with the VR interaction taking place before the FtF interaction.

Building on prior research on identity expression in VR, our study allowed participants in the “Alt-Self” condition to fully customize their avatars without any constraints, reflecting individual preferences. Meanwhile, in line with earlier work highlighting the role of voice in avatar presentation [51, 71], we incorporated voice as an additional element of the manipulation for the “Alt-Self” condition. In contrast, participants in the “Similar-Self” condition were encouraged to create avatars that closely resembled their real-world appearance, ensuring a sense of authenticity while still offering some degree of customization [70, 119]. Following Shih et al. [119], we provided a mirror to help participants in referencing their real-world appearance for the “Similar-Self” condition. The mirror was removed before the interaction task began to keep the subsequent environment consistent across conditions.

In both VR and FtF contexts, interactions followed the same structured sequence designed to progressively elicit and measure trust. This structure ensured comparability across conditions and minimized differences in interaction dynamics. This design allowed us to examine how avatar-based self-representation influences trust formation and how that trust persists or changes across contexts.

3.1 Setup

We used Meta Horizon Workrooms [2] as the social VR platform for this study. This environment was chosen for three key reasons: it supports high-quality, low-latency collaboration among multiple simultaneous users [46]; its Remote Desktop feature allows standardized materials (e.g., surveys and structured conversation prompts) to be presented directly in each participant’s field of view; and it includes integrated Meta Avatar creation tools that enable quick and flexible avatar customization. Participants created their avatars using the Meta Horizon mobile app on a tablet, with options to customize body, hair, face, and clothing (Figure 2c). We used Zoom to enable voice communication during the study. In the “Alt-Self” condition, participants’ voices were modified in real time using Voicemod to create an alternative vocal identity. All participants wore in-ear headphones throughout the VR interaction.

3.2 Participants

We recruited 48 participants (24 self-reported as women and 24 as men; age ranging from 19 to 29, $M = 24.65$, $SD = 3.01$), forming 24 unacquainted dyads that were randomly assigned to one of two conditions: the “Similar-Self” condition or the “Alt-self” condition. Dyads were balanced across three gender pairings: woman-woman, man-man, and man-woman (mixed-gender). All participants self-identified as Chinese and ethnically Asian and were fluent in Mandarin Chinese (see additional demographic details in Table 1).

Prior to participation, individuals were informed that the study would consist of four phases, as shown in Figure 3: (1) a pre-encounter preparation phase, (2) a VR encounter with an unacquainted partner, (3) a subsequent FtF meeting with the same partner, and (4) a follow-up online survey conducted one week later. VR sessions were screen-recorded from a researcher’s laptop to capture

verbal exchanges, avatar behaviors, and interaction dynamics. FtF interactions were audio-recorded only to document conversation content. Participants were not given any identifying information about their partner before the study. This study was approved by the Institutional Review Board (IRB).

3.3 Procedures

For each pair of participants, two researchers greeted them upon arrival and guided them individually to separate rooms, where the participants were seated at desks (Figure 4a). Two participants arrived at the laboratory five minutes apart to prevent prior acquaintance, which was later confirmed via participant self-report. They were randomly assigned to a condition, then received a briefing from the researchers and provided their consent before beginning the study.

Phase 1: Pre-Encounter. In the “Similar-Self” condition, participants first took a selfie that was used to auto-generate an avatar. They were also provided with a mirror to adjust the avatar using their reflection as a reference, allowing them to better match their real-world appearance in facial features, body, hairstyle, and clothing (Figure 2a). In the “Alt-Self” condition, participants were verbally instructed to be as creative as possible and to design an adventurous, imaginative, or alternative version of themselves, without referencing their real appearance (Figure 2b). After avatar creation, selfies were still collected to generate an auto-created version for comparison. Additionally, “Alt-Self” participants were also asked to choose a preferred voice pitch in the Voicemod software.

Following, participants completed a pre-interaction survey, including Demographics (i.e., age, gender, ethnicity, cultural background), prior VR and avatar creation experience, and comfort levels with meeting strangers in VR and FtF contexts. Participants also filled out a Big Five Inventory-2 short form version (BFI-2-S) [122] to examine whether personality traits served as potential moderating factors. Once both participants had finished, they put on Meta Quest 3 headsets and joined a shared Horizon Workrooms, confirmed their avatar (Figure 2d) and waited for interaction with the next phase. This phase lasted about 15 minutes.

Phase 2: VR Encounter. The VR interaction was structured into four sequential stages: (1) an observation and trust assessment stage, (2) an interaction and trust assessment stage, (3) a trust game, and (4) a semi-structured interview to gather qualitative insights. Researchers were present in all stages except the interaction, during which they only entered the room briefly to assist with prompt switching or technical issues and left immediately to minimize influence on participants. During the observation stage, participants familiarized themselves with the shared virtual meeting room, then rated their trust in their partner based solely on visual cues using the Trust Assessment Survey (TAS) we developed (see Table 2). The survey was presented on the remote desktop in VR, and participants were given a wireless mouse to choose their responses as shown in Figure 4b.

Following, participants engaged in a 3-minute icebreaker activity, which was guided by one prompt displayed on the remote desktop in VR, “Share three things you and your partner appear to have in common”. Afterward, participants moved into a 7-minute

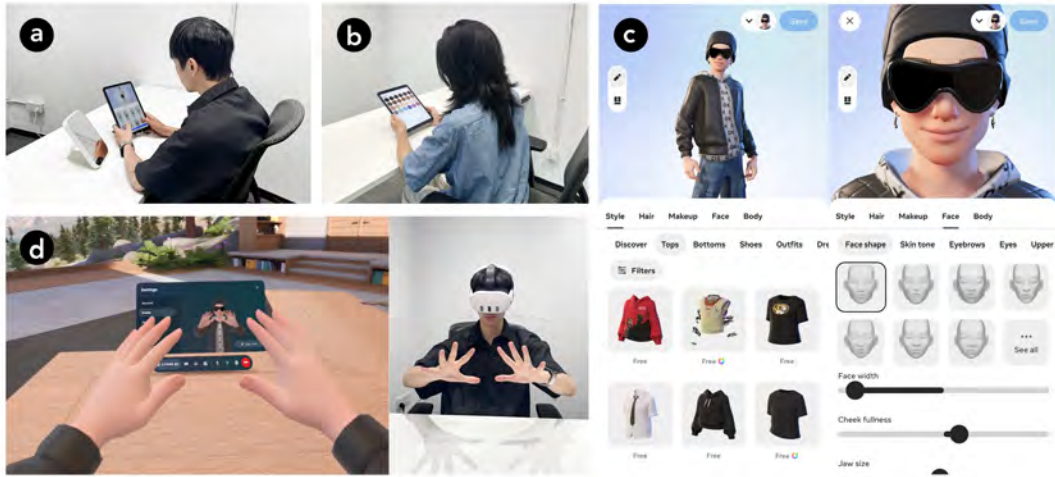


Figure 2: (a) Participants in the “Similar-Self” condition customized their avatars using a tablet while referencing a mirror. (b) Participants in the “Alt-Self” condition used a tablet to customize their avatars. (c) Through the Meta Horizon app, participants were able to adjust details such as body shape, facial features, clothing, and accessories. (d) After finishing avatar customization, participants were asked to enter VR to confirm their appearance.

Table 1: Participants’ self-reported demographics (N = 48).

Demographic information	Participant counts or statistics
Age	$M = 24.65$; $SD = 3.01$; $range = 19-29$
Gender	Women (24), Men (24)
Ethnicity	Asian/Chinese (48)
Cultural Background	Domestic only (37), Overseas study/work (11)
Prior VR Experience	Never (5), Once (13), Few times/year (15), Once/month (2), Few times/month (4), Few times/week (4), Every day (2)
Prior Social VR Experience	Yes (1), No (47)
Prior Avatar Creation Experience	Yes (23), No (25)
Prior Online-to-offline Social Experience	Yes (31), No (17)
Comfort Meeting Strangers Face-to-Face (1 = Extremely uncomfortable, 7 = Extremely comfortable)	$M = 4.06$ (7-point scale), $SD = 1.36$; Neutral (17), Somewhat comfortable (7), Very comfortable (6), Extremely comfortable (2), Somewhat uncomfortable (12)
Comfort Meeting Strangers in VR (1 = Extremely uncomfortable, 7 = Extremely comfortable)	$M = 4.29$ (7-point scale), $SD = 1.25$; Neutral (23), Somewhat comfortable (18), Very comfortable (6), Extremely comfortable (1)

structured conversation (Figure 1a). The icebreaker and structured conversation both followed the Fast Friends protocol [7] to encourage mutual self-disclosure. More details of prompts are in Appendix Table 5. Immediately after the VR encounter, participants completed the second TAS to capture Post-VR trust ratings. Participants then took part in a one-round trust game [16] as shown in Figure 5, which appeared as an additional online form with a game explanation. In this game, each participant received 10 local currency and decided how much to invest in their partner (from 0 to 10 local currency). The invested amount was tripled before being received by their partner, who then decided how much to return (from 0 to the tripled invested amount). Both participants made investment and return decisions independently. The amount sent by the participant

served as an indicator of their trust in their partner, a larger amount indicates greater trust. After participants entered their investment, the researchers reviewed the values and exchanged them with their partners, who then submitted their return amounts. Finally, each participant took part in a semi-structured interview lasting an average of three minutes ($Max = 6.15$, $Min = 2.11$, $SD = 0.95$) to report their VR encounter experience. The interview focused on two topics: (1) avatar customization, including how participants chose their avatar’s appearance and how connected they felt to it, and (2) Post-VR trust formation, including first impressions of their partner’s avatar and which aspects of appearance or behavior

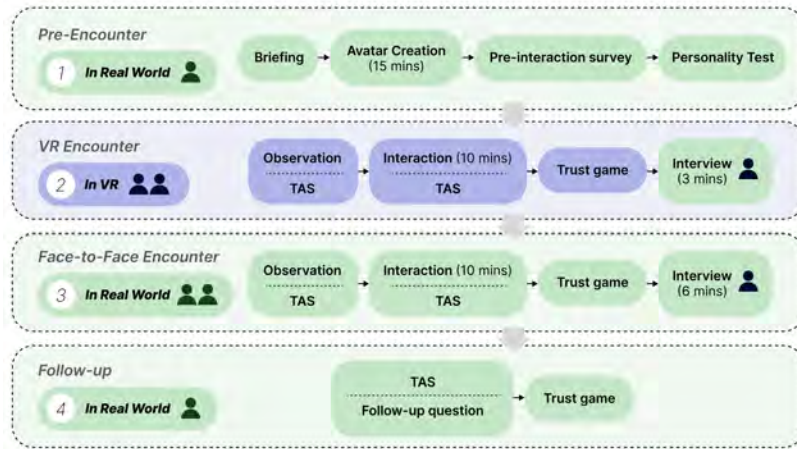


Figure 3: Experimental procedure. Sections in green background indicate that the phase was conducted in the real world, while the purple background indicates that the phase was conducted in VR.

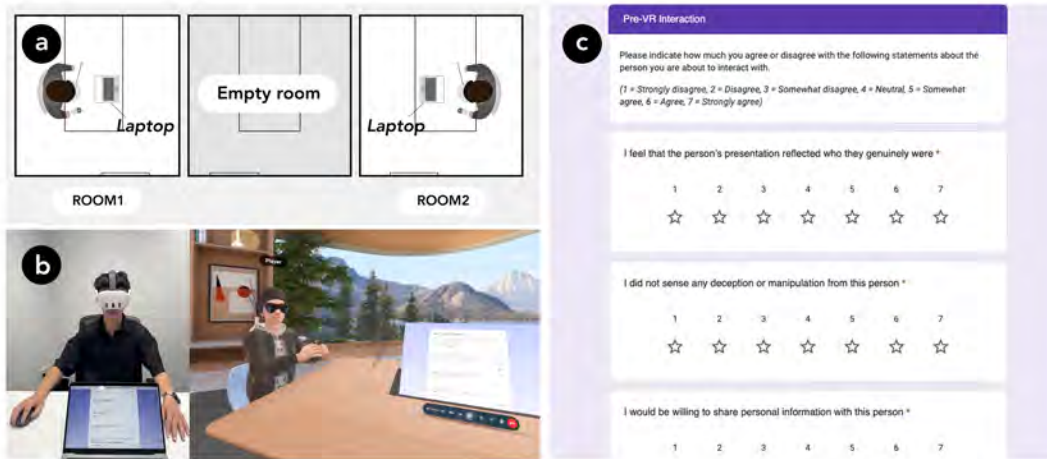


Figure 4: (a) The two participants took part in the experiment in separate rooms. (b) Upon entering the VR meeting room, participants observed their partner without verbal communication and completed the survey using the remote desktop and a wireless mouse. (c) The survey displayed on the remote desktop during the observation phase, where participants answered trust-related questions.

shaped their trust. Interview length varied across participants depending on the detail they provided. More details of interview are in Appendix Table 6.

Phase 3: FtF Meeting. Participants were then brought together in a common physical room for their first FtF meeting and seated 1.5 m apart (Figure 1c). The room replicated the VR setting, with the same desk arrangement and seating orientation. Similarly, they repeated the four-stage VR interaction: completing the TAS directly after the observation stage, followed by an icebreaker activity and a structured conversation. After a 10-minute interaction, participants completed the TAS and the trust game, followed by a final reflection interview lasting an average of six minutes ($Max = 10.13, Min = 4.03, SD = 1.45$). This Post-FtF interview focused on two themes:

(1) VR-to-FtF trust development, including whether participants' perceptions changed after meeting their partner in person and how FtF communication compared to VR in terms of trust and openness, and (2) overall trust building experience, prompting reflections on what could support or enhance trust as interactions move between VR and FtF settings. The lab session lasted approximately one hour in total, including Phase 1 (Pre-Encounter), Phase 2 (VR Encounter), and Phase 3 (FtF Meeting).

Phase 4: Follow-up. One week after the lab sessions, participants completed a follow-up survey including the same TAS, an online trust game, open-ended questions about further contact with their partners and how impressions persisted over time. The follow-up

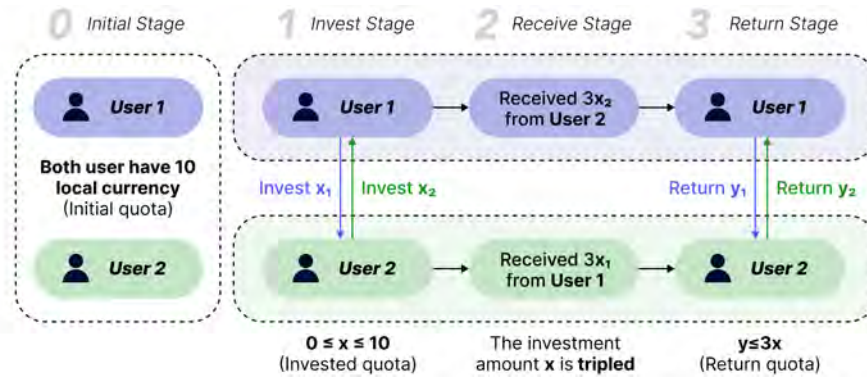


Figure 5: Procedure of the Trust Game. In Stage 0, both users start with 10 local currency. In Stage 1, the sender invests an amount x ($0 \leq x \leq 10$). In Stage 2, the invested amount is tripled and received by the partner. In Stage 3, the receiver returns an amount y ($0 \leq y \leq 3x$). The invested amount x indicates trust.

questions include: whether participants’ impressions of their partner had changed over the week, whether they had any additional contact, their willingness to meet the partner again, which aspects of the partner left the strongest overall impression, what left the strongest impression, how they made decisions in the trust game, and whether it influenced their perception of the interaction (see Appendix Table 6). Upon completion, they received compensation of 8 USD plus additional compensation based on their investment in the trust games.

3.4 Data Collection

During the study, we employed a mixed-methods approach to capture data: surveys and behavioral games yielded quantitative evidence, while semi-structured interviews and session recordings provided qualitative insights.

3.4.1 Quantitative Data. Survey measure of trust. We designed a customized seven-item TAS to assess participants’ perceived trust in their partner. Because trust is a multifaceted construct that can be interpreted differently across contexts [13, 58], we grounded our measurement design in McKnight and Chervany’s seminal trust model [60], which synthesizes trust research across psychology, sociology, and management. Their model identifies three core “trusting belief” dimensions: *competence* (the belief that a partner is capable and effective), *benevolence* (the belief that a partner has goodwill and cares about one’s welfare), and *integrity* (the belief that a partner is honest and adheres to acceptable principles). These dimensions are widely recognized as foundational to interpersonal trust and are suitable for capturing trust formation between strangers, which aligns with the goals of our study. We adopted this framework because existing validated trust instruments generally target relational contexts that do not align with brief, avatar-mediated encounters between unacquainted individuals or our VR-to-FtF paradigm. For example, commonly used scales (e.g., ITS [113], GTS [150], KUSIV3 [12]) assess generalized trust, and VR-oriented measures (e.g., Bente et al.’s collaboration scale [15]) address different contexts. Recent VR studies [9, 87] have

likewise developed context-specific trust questionnaires tailored to their research aims.

Guided by McKnight and Chervany’s model and these contextual constraints, we developed two items for each “trusting belief” dimension, complemented by one item measuring overall trust explicitly (see Table 2). All items were rated on a 7-point Likert scale ranging from 1 (“Strongly Disagree”) to 7 (“Strongly Agree”), with higher scores indicating greater trust. This TAS was administered five times: during VR observation, after VR interaction, during FtF observation, after the FtF interaction, and in the follow-up survey.

Behavioral measure of trust. To quantitatively measure participants’ trust in their partners, we adopted the classic trust game [16] as described in 3.3. We followed prior studies design [107], which employed relatively small monetary stakes to measure interpersonal trust in laboratory settings. This trust game was conducted three times during the study: after the VR interaction, after the FtF interaction, and in the follow-up survey.

Personality traits. To assess the possibility that personality moderates the results, we administered the short form of Big Five Inventory-2 (BFI-2) [121], the BFI-2-S [122], which assesses all five personality dimensions using fewer items while maintaining the original measure’s conceptual integrity. The BFI-2-S contains 30 items in total, with six items for each of the five personality traits: Extraversion, Agreeableness, Conscientiousness, Negative Emotionality, and Open-Mindedness. Each trait is scored by summing the responses to the six items, with some items reverse-scored. This scoring method results in a total score for each personality trait, ranging from 6 to 30 [122].

3.4.2 Qualitative Data. Semi-structured interview transcripts. Semi-structured interviews were conducted with each participant immediately after the VR interaction and again after the FtF interaction. Interviews explored participants’ perceptions of their partner, impressions of trust, and reflections on how the interaction unfolded. All interviews were audio-recorded, transcribed, and anonymized prior to analysis.

Open-ended questions in follow-up study. In the follow-up study, participants responded to open-ended questions as describe

Table 2: Trust Measurement Items and Associated Trust Model Dimensions

Please rate the following statements from 1 (strongly disagree) to 7 (strongly agree) according to your intuition.	Trust Model Dimension
(1) I feel that the person’s presentation reflected who they genuinely were.	Integrity
(2) I did not sense any deception or manipulation from this person.	Integrity
(3) I would be willing to share personal information with this person.	Benevolence
(4) I would feel comfortable being in the same room with this person.	Benevolence
(5) If I need some advice, I would feel comfortable asking this person for help.	Competence
(6) If we were performing a task together, I would feel confident following this person’s guidance.	Competence
(7) Overall, I would trust this person.	Explicit

in subsection 3.3. Responses were collected online, anonymized, and thematically analyzed to explore how trust evolved over time.

3.5 Data Analysis

In the study, although dyads were the unit of random assignment, trust formation is inherently an individual-level psychological process. Each participant independently reported their perceived trust, made their own investment decisions in the trust game, and provided individual interview responses. Therefore, all statistical analyses treated participants as individual data points. We did not include gender composition as a factor in the analysis because gender effects were not the focus of the present work and our sample size did not provide sufficient power to examine gender-pairing influences [72].

3.5.1 Quantitative Data. The quantitative analysis was performed in RStudio (Version 2025.09.2+418) on a sample of 48 participants ($N = 24$ per condition). The study incorporated both between-subject comparisons of two *Avatar Customization Conditions* (“Similar-Self” vs. “Alt-Self”) and repeated measures of five *Interaction Stages* across contexts (VR vs. FtF vs. one-week follow-up) as within-subject comparisons, designed to address the effect of avatar customization on shaping trust during VR encounters (**RQ1**) and how that VR-established trust transfers and retained to subsequent FtF contexts (**RQ2**). Initial data inspection using QQ plots and the Shapiro-Wilk test indicated a violation of the normality assumption for both behavioral and self-reported survey measurement of trust. We therefore employed an Aligned Rank Transform (ART) ANOVA [148]. All post-hoc comparisons were performed using pairwise comparisons of Estimated Marginal Means (EMMs), with Holm-Bonferroni’s corrections applied. Additionally, personality traits, measured using BFI-2-S, were explored to identify potential moderating effects on the observed trust outcomes. We used the score (ranging from 1 to 7) of the explicit trust item (see Q7 in Table 2) as the main measurement of trust, along with the scores for the three dimensions of trust: integrity, benevolence, and competence (average of each two related items). Investment amount (0 to 10) is used as the behavioral measurement of trust.

3.5.2 Qualitative Data. We analyzed the semi-structured interview transcripts using Braun and Clarke’s thematic analysis approach [23, 24]. Since all interviews were conducted in Mandarin

Chinese, the research team performed all coding and qualitative analysis using the original Chinese transcripts. The interview excerpts were then translated into English during the writing stage, and each translation was carefully checked to ensure that the English wording accurately reflected the meaning of the original responses. The analysis followed their six-step process: (1) Familiarizing with the data: Two authors reviewed the transcribed interviews line by line to understand participants’ perceptions of their own and their partner’s avatars and how avatar-mediated interactions influenced trust; (2) Generating initial codes: The authors independently assigned preliminary codes to key interview quotes, then compared and refined them to ensure clarity and distinctiveness; (3) Constructing themes: The authors grouped the codes into broader categories, identifying sub-themes related to avatar customization, trust formation, and the transition from VR to FtF; (4) Reviewing themes: The authors collaboratively discussed and refined the emerging themes; (5) Defining themes: The final themes were confirmed and clearly defined, with illustrative quotes selected to support them; (6) Producing the report: The authors organized the themes and drafted the final report structure [24].

4 Results

4.1 How Avatar Customization Shapes Trust During Social VR Encounters (RQ1)

For **RQ1**, we focused on: (1) whether avatar customization shaped trust perceptions during initial VR encounters; and (2) how trust developed during the VR interaction phase across avatar conditions.

4.1.1 Impacts of Avatar Customization on Trust Perceptions. To specifically examine how trust develops from before to after the VR encounter (rather than across all interaction stages), we conducted a 2×2 ART ANOVA with *Avatar Customization Condition* (“Similar-Self” vs. “Alt-Self”) as the between-subject factor and *Interaction Stage* (Pre-VR vs. Post-VR) as the within-subject factor on self-reported trust (Explicit Trust, Integrity, Benevolence, and Competence). In addition, Behavioral Trust measured by investment amount in Post-VR trust game was analyzed using a one-way

ART ANOVA with *Avatar Customization Condition* as the between-subject factor.

We did not find a significant interaction between *Avatar Customization Condition* and *Interaction Stage* (see Table 3). However, the ART ANOVA revealed a significant main effect of *Avatar Customization Condition* on Integrity-based trust ($F(1, 46) = 4.975, p = .031$), indicating that participants generally perceived partners in the Similar-Self condition as more trustworthy than those in the Alt-Self condition across both stages. Descriptively, participants in the “Similar-Self” condition rated their partner higher on integrity both during the observation stage ($M_{PreVR} = 5.13, SD_{PreVR} = .90$) and after the interaction ($M_{PostVR} = 5.81, SD_{PostVR} = .87$) compared to those in the “Alt-Self” condition ($M_{PreVR} = 4.29, SD_{PreVR} = 1.37$; $M_{PostVR} = 5.27, SD_{PostVR} = 1.31$). No significant interaction between Condition and Stage was found ($F(1, 46) = 2.30, p = .136$).

While the quantitative results showed limited significant effect of avatar customization, participants’ qualitative accounts illuminate how appearance and voice shaped trust formation during initial Social VR encounters.

Avatar Appearance as an Anchor for Early Trust Formation. Participants noted that avatar appearance was the initial evaluative anchor for how trustworthy or approachable an unacquainted partner seemed upon meeting in VR. Figure 6 displays the customized avatars created by 48 participants.

In the “Similar-Self” condition, self-resembling avatars were generally seen as *approachable* and sometimes even *familiar*, which reduced initial uncertainty and supported early trust. In the “Alt-Self” condition, reactions varied more widely and depended on creative customization choices: playful or coherent designs helped trust, whereas highly stylized or unrealistic avatars introduced doubt. This suggests that avatar customization shaped how certain or uncertain participants felt about their partner at first glance, with self-resembling avatars providing the most stable trust baseline.

Voice as a Key Cue for Integrity-Based Trust. While avatar appearance provided an immediate evaluative anchor, some participants stated that their first impressions were adjusted once interaction began in VR. Fourteen participants viewed voice as more authentic and less manipulable, therefore more trustworthy than visual design, indicating trust in VR does not depend on the avatar appearance alone. In the “Similar-Self” condition, unaltered voices reinforced perceived sincerity, whereas in the “Alt-Self” condition, voice modulation sometimes created mismatches that raised credibility concerns (e.g. P17 and P18). Yet trust could still develop when altered voices were perceived as genuine. These accounts suggest that while avatar’s visual customization shapes initial impressions, voice ultimately comes in as a stronger cue for building integrity-based trust.

4.1.2 Development of Trust during VR Encounter. Significant main effects of *Interaction Stage* were observed for all self-reported trust measures during VR encounters, as indicated by the 2×2 ART ANOVA (all $ps < .001$; see Table 3). Post-hoc pairwise comparisons further showed that trust reliably increased from Pre-VR to Post-VR. These increases occurred regardless of avatar condition, demonstrating that **the VR interaction itself meaningfully elevated self-reported trust**. Additionally, the one-way ART ANOVA on

Post-VR investment revealed no significant effect of *Avatar Customization Condition* ($F(1, 46) = .053, p = .819$), indicating the investment behavior did not differ significantly across the “Similar-Self” and “Alt-Self”.

Conversation as a Catalyst for Development of Trust. Over half of the participants ($N = 26$) reported conversations, not appearance, shaped trust during VR encounters. In the “Similar-Self” condition, participants described communication as reinforcing an already neutral-to-positive baseline set by familiar-looking avatars. In the “Alt-Self” condition, conversation played an even more central role in compensating for initial uncertainty created by stylized avatars. As P43 (Alt-Self) stated, “*What made me trust them was the conversation...not their appearance*”, and P14 (Similar-Self) noted that “*the way they communicated became more important than how they looked*”. Self-disclosure ($N = 9$) further deepened trust, with shared personal details interpreted as sincerity and prompting reciprocal openness; e.g., “*our sharing is an equal exchange*” (P46, Alt-Self). In addition, several participants across both conditions (e.g., P12, P28, P33, P39) highlighted conversational qualities: *thoughtfulness, responsiveness, guiding the flow of conversation, and providing detailed answers* as indicators of authenticity and sincere engagement, which further reinforced interpersonal trust. Participants ($N = 5$) also indicated that shared interests or experiences provided common ground that strengthened rapport. For example, P21 and P22 (Alt-Self) bonded over their pet dogs, while P35 and P36 (Similar-Self) discovered they both struggled with procrastination. These cases show that conversations were not only a medium for exchanging information but also a catalyst for trust development during the VR encounter, extending beyond what avatar appearance or voice alone could provide.

Navigating Uncertainty and Constraints in VR. Participants ($N = 17$) highlighted that building trust in VR was not immediate but shaped by the uncertainty and constraints of the medium. Five participants shared that they sensed a layer of *artificiality* or even mild *deception* in avatar representations. P41 (Similar-Self) admitted, “*It was hard to imagine their real self from the avatar*,” The superficial presence of avatars and the absence of detailed non-verbal cues such as subtle gestures and expressions further limited their ability to read authenticity, with P4 (Alt-Self) remarking that “*everything feels artificial in VR*.” The lack of non-verbal cues was particularly problematic for participants who relied heavily on visual feedback for trust assessment and were brought up more frequently in the “Alt-Self” condition than the “Similar-Self” condition. Still, there were rare moments where body language contributed positively (see Figure 7); such as, P1 and P2 (Alt-Self) frequently gave thumbs-up gestures as reassuring signals, and P19 and P20 (Alt-Self) attempted a high-five that unexpectedly triggered a visual effect, which helps deepen their sense of connection.

Table 3: ART ANOVA and post-hoc results for self-reported survey measurement of trust during the VR encounter and Post-VR behavioral measurement of trust. Type III Wald tests with Kenward–Roger degrees of freedom. $df(\text{num}, \text{den}) = \text{degrees of freedom (numerator, denominator)}$

DV	Effect	F	$df(\text{num}, \text{den})$	p	Post Hoc
Explicit Trust	Avatar Customization Condition	1.93	1, 46	.172	<i>ns</i>
	Interaction Stage	57.6	1, 46	< .001***	Post-VR > Pre-VR
	Condition \times Stage	.001	1, 46	.972	<i>ns</i>
Integrity	Avatar Customization Condition	4.98	1, 46	.031*	Similar-Self > Alt-Self
	Interaction Stage	41.0	1, 46	< .001***	Post-VR > Pre-VR
	Condition \times Stage	2.30	1, 46	.136	<i>ns</i>
Benevolence	Avatar Customization Condition	.285	1, 46	.596	<i>ns</i>
	Interaction Stage	45.9	1, 46	< .001***	Post-VR > Pre-VR
	Condition \times Stage	.157	1, 46	.694	<i>ns</i>
Competence	Avatar Customization Condition	.235	1, 46	.630	<i>ns</i>
	Interaction Stage	32.4	1, 46	< .001***	Post-VR > Pre-VR
	Condition \times Stage	1.49	1, 46	.228	<i>ns</i>
Behavioral Trust	Avatar Customization Condition	.053	1, 46	.819	<i>ns</i>

Note. *ns* = not significant, * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

4.2 Trust Development from Social VR to FtF Context (RQ2)

Given the strong main effect of VR interaction stage observed in RQ1, we further examined how trust evolved as participants moved from the VR interaction into the FtF meeting and to the one-week follow-up.

A 2×5 repeated measures ART ANOVA was used to analyze self-reported trust. This model included *Avatar Customization Condition* (2 levels) as the between-subjects factor and *Interaction Stage* (5 levels: Pre-VR, Post-VR, Pre-FtF, Post-FtF, Follow-up) as the within-subjects factor. A separate 2×3 repeated measures ART ANOVA was performed for Behavioral Trust using *Avatar Customization Condition* as the between-subjects factor and *Interaction Stage* (3 levels: Post-VR, Post-FtF, and Follow-up) as the within-subjects factor. The descriptive trends across stages for all trust measures are visualized in Figure 8, and the ART ANOVA results are displayed in Table 4 (See Appendix Table 7 and Table 8 for complete post-hoc pairwise comparisons).

4.2.1 Effects of Avatar Customization on Trust Across Context. A significant main effect of *Avatar Customization Condition* was only observed for the Integrity-based trust. Participants in the “Similar-Self” condition reported higher Integrity-based trust than those in the “Alt-Self” condition, ($F(1, 46) = 8.371, p = .006$), a difference confirmed by post-hoc comparisons. Explicit Trust scores did not differ significantly between *Avatar Customization Condition*, ($F(1, 46) = 3.008, p = .090$), nor were there significant effects for Benevolence, ($F(1, 46) = 1.367, p = .248$), or Competence, ($F(1, 46) = 0.830, p = .367$). Behavioral Trust likewise showed no significant difference between “Similar-Self” versus “Alt-Self” conditions, ($F(1, 46) = 0.415, p = .523$). This finding suggests that, although avatar customization had little effect on most trust indicators, a self-resembling avatar enhanced general perceptions of a partner’s integrity.

Recalibration of Trust during the FtF Encounter. Participants’ reflections suggested that impressions formed through avatars played a role in guiding how they recalibrated trust when transitioning to the FtF meeting. Eleven participants (four of “Similar-Self” and seven of “Alt-Self”) reported a noticeable mismatch between their partners’ avatar and their real self during the FtF encounter. These participants described the transition as inconsistent, with the offline encounter prompting them to recalibrate prior impressions and reconsider their trust formed in VR. P21 (Alt-Self) felt like he was *getting to know a completely new person*, while P44 (Similar-Self) described it was *like a reset* when earlier assumptions no longer aligned. Yet recalibration did not necessarily undermine trust. For some, personality consistency helped dissolve initial dissonance. As P4 (Alt-Self) noted that although the appearance *seemed mismatched*, after FtF conversation he better understood how his partner’s personality was reflected in it. P17 (Alt-Self) similarly described a brief *mental shift* before trust reconsolidated. For these participants, the adjustment was a short-lived interruption rather than a setback.

4.2.2 Carryover of VR-Established Trust into FtF Encounter. Post-hoc comparisons showed that trust levels at Pre-FtF remained stable relative to Post-VR, indicating that trust formed in VR carried over into the FtF context. Explicit Trust at Pre-FtF did not differ from Post-VR ($M_{PreFtF} = 5.23, SD_{PreFtF} = 1.23$; $M_{PostVR} = 5.33, SD_{PostVR} = 1.23$; $p = .488$), and the same pattern held for Integrity ($M_{PreFtF} = 5.51, SD_{PreFtF} = 1.12$; $M_{PostVR} = 5.54, SD_{PostVR} = 1.13$; $p = .674$), Benevolence ($M_{PreFtF} = 5.17, SD_{PreFtF} = 1.16$; $M_{PostVR} = 5.37, SD_{PostVR} = 1.13$; $p = .186$), and Competence ($M_{PreFtF} = 5.14, SD_{PreFtF} = 1.22$; $M_{PostVR} = 5.04, SD_{PostVR} = 1.25$; $p = .676$).

After this continuous transition, trust increased significantly after the FtF interaction. Explicit Trust was higher at Post-FtF ($M_{PostFtF} = 5.98, SD_{PostFtF} = .956$) than at Pre-FtF ($p < .001$), with comparable increases observed for Integrity, Benevolence,



Figure 6: 48 participant-created avatars from the “Similar-Self” (purple) and “Alt-Self” (green) . Participants can customize their avatars’ appearance, including hair, facial features, clothing, and accessories.

and Competence. We also observed that Behavioral Trust increased in the FtF context compared to the VR context ($M_{PostVR} = 7.63, SD_{PostVR} = 2.08; M_{PostFtF} = 8.85, SD_{PostFtF} = 1.61; p = .002$). This pattern suggests that trust was preserved across the VR-to-FtF shift and strengthened through following direct in-person engagement. To complement these quantitative results, the qualitative narratives reveal how participants experienced consistencies and changes in trust over as they transitioned from VR into FtF interaction.

Trust Continuity and Reinforcement in FtF Encounter. Participants described a strong sense of continuity between VR and FtF encounters. Nearly half of the participants ($N = 23$; 13 in “Similar-Self”

and 10 in “Alt-Self”) reported their perceptions of their partners remained consistent across VR and FtF, often anchored by stable vocal and conversational cues. P33 (Similar-Self) and P17 (Alt-Self) similarly noted that their partners’ *way of speaking is the same in VR and the real world*, making the FtF meeting feel like a *natural continuation* rather than having to start the relationship without any prior basis. Participants ($N = 12$) also reported positive shifts upon meeting in person. “Similar-Self” participants noticed *more personality and liveliness*, while “Alt-Self” participants reported *discovering greater friendliness and detail*. These experiences often strengthened trust; P12 described VR as creating a *halo effect*, and



Figure 7: Nonverbal communication in VR workrooms: (Left) P2 used thumbs-up gestures to provide positive feedback to P1. (Right) P19 and P20 attempted a high-five, triggering a visual effect upon contact.

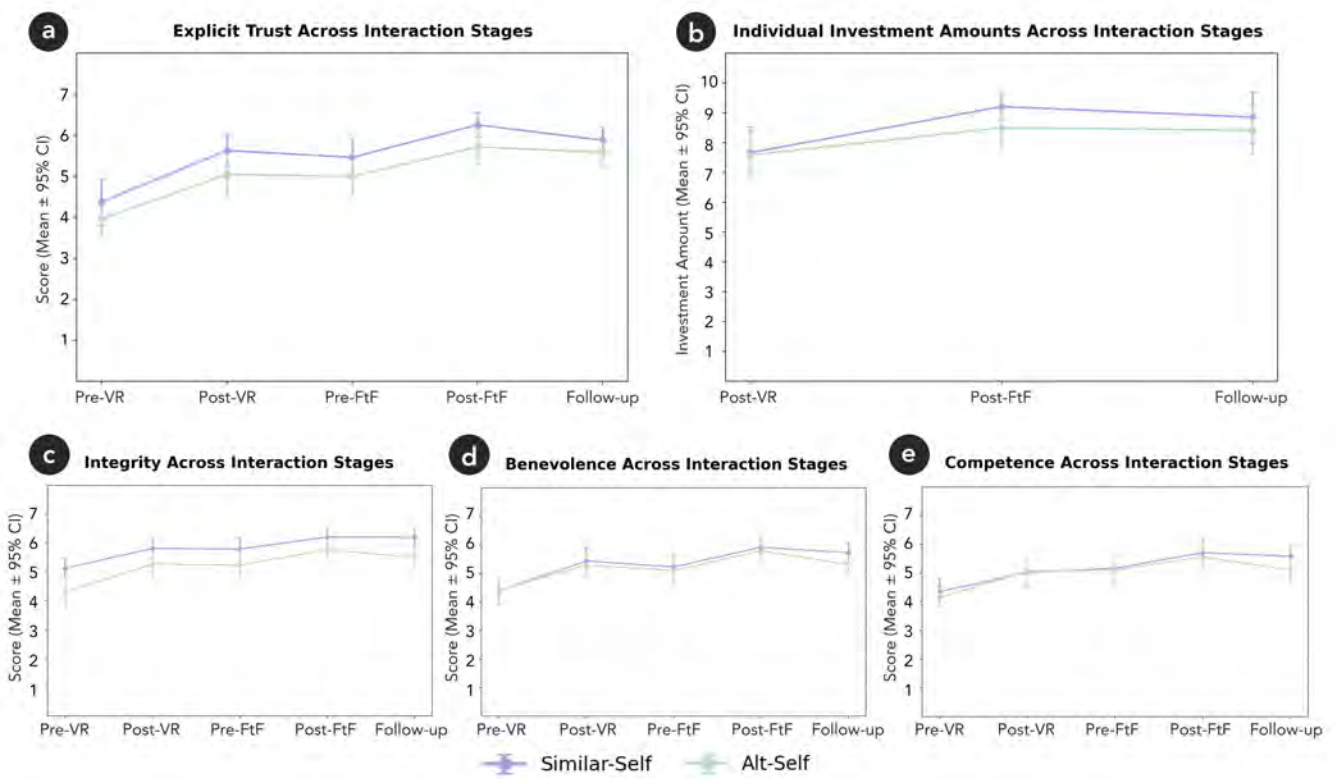


Figure 8: Self-reported and Behavioral trust measures across five interaction stages for the “Similar-Self” (purple) and “Alt-Self” (green) conditions. (a) Explicit trust scores measured at Pre-VR, Post-VR, Pre-FtF, Post-FtF, and Follow-up. (b) Behavioral trust measured via individual investment amounts at Post-VR, Post-FtF, and Follow-up. (c) Integrity-based trust dimension scores. (d) Benevolence-based trust dimension scores. (e) Competence-based trust dimension scores. Error bars represent $\pm 95\%$ confidence intervals.

several (e.g., P34, P47) stated they *feel more trust after meeting the real person*.

Most participants (N = 36; 20 “Similar-Self,” 16 “Alt-Self”) preferred meeting unacquainted individuals FtF, with seven stating it would have been better to meet directly in person. They emphasized that non-verbal cues such as eye contact, facial expressions,

and body language, offered stronger grounds for judging trustworthiness. As P22 (Alt-Self) explained, *direct facial expressions and body language give me more confidence*, and P41 (Similar-Self) noted that FtF interaction felt *more real*. Participants also highlighted that FtF meetings felt safer and more comfortable, reducing uncertainty when meeting someone new. P34 (Similar-Self) trusted more when the partner was *physically present*, and P1 (Alt-Self)

Table 4: ART ANOVA and post-hoc results for self-reported survey measurement of trust and behavioral measurement of trust across all interaction stages. Type III Wald tests with Kenward–Roger degrees of freedom. $df(\text{num}, \text{den}) = \text{degrees of freedom (numerator, denominator)}$

DV	Effect	F	$df(\text{num}, \text{den})$	p	Post Hoc
Explicit Trust	Avatar Customization Condition	3.01	1, 46	.090	<i>ns</i>
	Interaction Stage	40.36	4, 184	< .001***	Post-VR > Pre-VR *** Pre-FtF > Pre-VR *** Post-FtF > Pre-VR *** Follow-up > Pre-VR *** Post-FtF > Post-VR *** Follow-up > Post-VR * Post-FtF > Pre-FtF *** Follow-up > Pre-FtF **
	Condition × Stage	.074	4, 184	.990	<i>ns</i>
Integrity	Avatar Customization Condition	8.37	1, 46	.006**	Similar-Self > Alt-Self
	Interaction Stage	23.46	4, 184	< .001***	Post-VR > Pre-VR *** Pre-FtF > Pre-VR *** Post-FtF > Pre-VR *** Follow-up > Pre-VR *** Post-FtF > Post-VR * Post-FtF > Pre-FtF **
	Condition × Stage	1.28	4, 184	.280	<i>ns</i>
Benevolence	Avatar Customization Condition	1.37	1, 46	.248	<i>ns</i>
	Interaction Stage	29.58	4, 184	< .001***	Post-VR > Pre-VR *** Pre-FtF > Pre-VR *** Post-FtF > Pre-VR *** Follow-up > Pre-VR *** Post-FtF > Post-VR ** Post-FtF > Pre-FtF *** Follow-up > Pre-FtF * Post-FtF > Follow-up *
	Condition × Stage	.299	4, 184	.878	<i>ns</i>
Competence	Avatar Customization Condition	.830	1, 46	.367	<i>ns</i>
	Interaction Stage	24.01	4, 184	< .001***	Post-VR > Pre-VR *** Pre-FtF > Pre-VR *** Post-FtF > Pre-VR *** Follow-up > Pre-VR *** Post-FtF > Post-VR ** Post-FtF > Pre-FtF **
	Condition × Stage	1.03	4, 184	.393	<i>ns</i>
Behavioral Trust	Avatar Customization Condition	.415	1, 46	.523	<i>ns</i>
	Interaction Stage	8.28	2, 92	< .001***	Post-FtF > Post-VR ** Follow-up > Post-VR **
	Condition × Stage	.085	2, 92	.919	<i>ns</i>

Note. *ns* = not significant, * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

found FtF encounters *more reassuring than VR*. Additionally, some felt more open and expressive in person; P35 (Similar-Self) was *more open and less reserved than in VR*, and P27 (Alt-Self) described communication as *smoother*. Trust was therefore further reinforced through these in-person cues, as richer non-verbal signals, a greater sense of safety, and increased openness made FtF encounters a more dependable context for unacquainted partners.

4.3 Lasting Impressions of VR-Established Trust (RQ2)

4.3.1 Stability of Trust at One-Week Follow-Up. Explicit Trust remained stable at the one-week follow-up ($M_{FollowUp} = 5.73$, $SD_{FollowUp} = .869$), showing no significant decline relative to Post-FtF ($p = .081$); Behavioral Trust showed the same pattern, with follow-up investment ($M_{FollowUp} = 8.64$, $SD_{FollowUp} = 2.08$) remaining without significant difference from Post-FtF ($p = .973$),

indicating possible longer-term retention across both behavioral and self-report measures.

In our follow-up survey conducted online, most participants ($N = 34$) reported that their impressions of their partners remained stable one week later, with 12 participants maintaining contact with their partners after the lab study ended. Many ($N = 8$) continued to view their partners as *sincere* and *friendly*; for instance, P11 (Similar-Self) felt the partner *could potentially become a friend*, and P32 (Alt-Self) described theirs as *a very nice person*. These lasting impressions were shaped primarily by conversational content rather than visual cues. Twenty participants (10 per condition) identified prior dialogue as the most enduring factor, whereas only small numbers pointed to avatar appearance ($N = 3$), real-world appearance ($N = 4$), or the VR-to-FtF transition ($N = 3$). A smaller subset ($N = 7$) reported changes over time, both positive (e.g., P31: *I trust them more now because we found more shared interests*) and negative (e.g., P7: *not as close as before*). Another seven participants reported no added impressions, and a few ($N = 3$) described increased ambiguity. Overall, most participants retained or reinforced their initial views, suggesting that VR-established and FtF-reinforced trust persisted meaningfully one week after the interaction.

4.3.2 Conditional Openness and Context Preferences for Future Interaction. We also asked participants whether they would be open to meeting their partner again. Most participants chose *Maybe* ($N = 33$), indicating conditional openness shaped by shared interests (e.g., P9's interest in the partner's research; P47 (Alt-Self) discovering they were moving to the same city). A smaller number said *Yes* ($N = 10$) or *No* ($N = 5$), with those declining citing a lack of *compelling reason* or insufficient connection (e.g., P17, P34). Preferences for future interaction varied. Some preferred staying in VR, feeling *not yet close enough for FtF* (P19) or more *relaxed in online virtual environments* (P26). Others favored FtF for its richer cues and stronger trust, aligning with findings in Section 4.2.2. Many participants ($N = 26$) appreciated having VR occur first, describing it as a low-cost *filtering stage* (P9) and an effective *icebreaker* that reduced FtF awkwardness (e.g., P7, P12, P33). VR helped *set expectations, ease tension*, and acted as a *social buffer* before meeting an unacquainted partner in person. Beyond this bridging role, participants also valued VR's intrinsic advantages: being *enjoyable* (P29), encouraging *greater openness* through avatars (P6, P34, P36), *reducing social costs* and travel, and offering a sense of *privacy, safety, and freedom*. For some, like P26 (Alt-Self), VR also reduced feelings of judgment and made disengagement easier when needed.

4.4 Potential Individual Differences in Trust Formation

We conducted exploratory Pearson correlations to examine whether Big Five personality traits were associated with trust across the interaction stages. Across all trust measurement, correlations with the five personality traits (Extraversion, Agreeableness, Conscientiousness, Negative Emotionality, and Open-Mindedness) were small ($|r| < .35$) and generally nonsignificant ($ps > .10$). A few isolated associations appeared at the Pre-VR stage; for example, higher Negative Emotionality was weakly associated with lower Integrity

($r = -.35, p = .015$), Extraversion showed a small positive association with Benevolence ($r = .31, p = .035$), and lower Agreeableness was associated with higher Explicit Trust ($r = -.30, p = .042$). Yet, these effects did not replicate at subsequent stages and did not form any coherent pattern. We did not observe any consistent relationships of personality traits with trust during the VR interaction, the subsequent FtF interaction or at follow-up. Personality traits also showed no meaningful correlations with Behavioral Trust (all $|r|s < .16, ps > .30$). Overall, these results suggest that individual differences in personality did not have a significant effect on shaping trust formation or transfer to FtF in this study. **Since personality was not controlled in this study, these results should be interpreted as exploratory rather than conclusive.** Overall, the trust trajectories identified in RQ1 and RQ2 were largely robust across individual differences in personality.

4.5 Summary

In summary, trust increased meaningfully during the VR interaction, with avatar customization affecting only the integrity component of trust. As shown in the ART ANOVA results (Table 3), participants in the “Similar-Self” condition reported higher integrity-based trust overall, but avatar customization did not affect Explicit Trust, Benevolence, Competence, or Behavioral Trust. These results indicate that while a self-resembling avatar may raise initial perceptions of integrity, trust formation in Social VR was largely shaped by the interaction itself rather than by avatar appearance.

Across both self-reported and behavioral trust, no significant interaction emerged between *Avatar Customization Condition* and *Interaction Stage* (Table 4). The absence of Condition \times Stage interactions for all trust measures demonstrates that trust developed and transferred in comparable ways across stages in both avatar conditions. The parallel trajectories visualized in Figure 8 further show that participants using “Similar-Self” and “Alt-Self” avatars followed nearly identical patterns of trust increase during VR, further strengthening during FtF, and possible retention at follow-up. Although a “Similar-Self” avatar enhanced integrity perceptions, avatar customization did not meaningfully alter how trust developed or persisted across VR, FtF, and follow-up contexts. Taken together, the findings demonstrate that trust established during the VR interaction, reinforced during FtF engagement, and maintained over the following week unfolded similarly across conditions, both in attitudinal reports and behavioral investments.

5 Discussion

In this section, we reflect on social VR mediated trust, discuss its challenges, propose design implications and outline limitations and future work. As our study primarily focuses on exploring how avatar customization influences trust formation during initial VR encounters (RQ1) and how trust transfers from VR to subsequent face-to-face meetings (RQ2), we employed an experimental design based on brief, goal-oriented interactions. Therefore, the results should be interpreted as reflecting the early stages of trust development rather than fully developed interpersonal trust.

5.1 Reflections on Social VR Mediated Trust

5.1.1 “Similar-Self” vs. “Alt-Self” Avatar Customization. Our **RQ1** asked how avatar-based self-presentation shaped trust during an initial social VR encounter. We found that avatar appearance meaningfully influenced first impressions but had limited influence on how trust subsequently developed through interaction. Avatar appearance served as an anchor for early trust judgments: “Similar-Self” avatars conveyed familiarity and reduced uncertainty when meeting an unacquainted partner. By contrast, “Alt-Self” avatars evoked curiosity but sometimes hesitation when highly stylized, reflected in lower integrity ratings during the VR encounter. Here, integrity refers to whether participants perceived their partner as honest, sincere, and non-deceptive, following McKnight and Chervany’s definition of integrity-based trusting beliefs [97]. In low-information first encounters, such judgments hinge on whether self-presentation appears coherent and authentic. Self-resembling avatars may have implicitly signaled transparency, whereas more stylized avatars introduced ambiguity that prompted brief uncertainty. This pattern aligns with prior research showing that people perceive and communicate differently with avatars that resemble versus diverge from their own self-representations [119], and that similarity between partners’ avatars can elicit positive reactions such as attraction and trust [34, 37, 38, 45].

Yet the effect of avatar appearance did not extend beyond these initial judgments. Once interaction began, the influence of appearance became less salient: both conditions showed significant increases in self-reported trust from Pre-VR to Post-VR, and behavioral trust games revealed comparable willingness to trust. Agnew likewise observed that meaningful connections and trust can emerge irrespective of avatar stylization [4], consistent with Macey et al., avatar stylization does not appear to be a decisive factor in shaping social experience outcomes [91].

As interaction unfolded, participants’ attention shifted toward voice and conversational cues, which emerged as more decisive indicators of trustworthiness. This aligns with prior work showing that vocal signals play a critical role in how humans perceive and evaluate avatars [32, 47, 71, 79]. In the “Similar-Self” condition, unmodified voices tended to reinforce coherence between appearance and behavior, thereby supporting trust. In the “Alt-Self” condition, however, voice modulation sometimes introduced brief uncertainty, especially when the altered voice did not match the avatar’s visual style. As Ferstl et al. note, believable voices can be more important than visual realism when perceptual mismatches arise [47], and audio-visual inconsistencies caused by vocal manipulation can diminish perceived authenticity [79]. While participants often treated voice as a relatively stable identity cue across settings, appearance remained influential during the earliest stages of impression formation.

5.1.2 Trust Building Through Reciprocal Conversation over Time. While avatar customization shaped initial impressions, being “trusted” based on appearance did not equate to being “trustworthy” through interaction. As soon as conversation began in VR, participants shifted from visual cues to behavioral evidence, evaluating trust based on how their partner communicated, disclosed personal information, and responded during the exchange. Across both avatar conditions, reciprocal conversation, where participants

engaged in back-and-forth and responsive exchanges, served as the catalyst for trust development during the VR interaction. Over time, as partners engaged in progressively deeper self-disclosure through the Fast Friends protocol, trust increasingly reflected interaction quality rather than avatar design. This aligns with work showing that structured communication supports rapid interpersonal closeness in both VR [4, 5, 66] and FtF contexts [124, 157]. Correspondingly, our quantitative results showed significant increases in trust from Pre-VR to Post-VR, and again from Pre-FtF to Post-FtF. However, because all pairs experienced the VR interaction before the FtF meeting, differences observed during the FtF phase should not be attributed to the medium transition alone and may also reflect stage or familiarity effects.

Our **RQ2** focused on how trust formed in social VR carried into subsequent FtF encounters. In our study, trust unfolded over time across both contexts. The trust established during the brief VR interaction generally carried forward into the FtF meeting, with no significant difference in ratings between Post-VR and Pre-FtF. Qualitatively, many participants described the FtF interaction as a continuation of their VR conversation rather than a second first impression. This gradual strengthening of trust reflects Social Penetration Theory [138] and Uncertainty Reduction Theory [108], participants’ trust deepened through reciprocal self-disclosure that reduces ambiguity and fosters mutual understanding. By measuring trust across multiple interaction stages, our study extends these theoretical perspectives by showing that social VR-mediated trust was not only temporary but also carried forward into FtF interaction, providing empirical evidence that trust initiated in VR and consolidated in person can serve as a valid foundation for continued interpersonal connection.

5.1.3 Social VR as a Buffer When Meeting Unacquainted Individuals. Reflecting on how trust unfolded in social VR, we also note that the medium plays a distinct role in structuring early encounters. As a hybrid form that bridges CMC and FtF interaction, social VR provides conditions that can support the formation of initial trust, even between unacquainted individuals. Compared to traditional CMC, avatars in social VR mask facial details [1, 93], offering a degree of anonymity that lowers social barriers and reduces the pressure often associated with first meetings. Participants in our study described this as a helpful buffer, noting that it made early interactions feel less awkward, consistent with prior work showing that avatars can ease social costs and facilitate more comfortable initial exchanges [14, 62, 144]. At the same time, social VR affords embodied avatars and shared spatial environments, features that exceed the expressive bandwidth of text- or video-based platforms. These affordances enable greater control over self-presentation and allow interactions to feel more dynamic and responsive [10, 104]. These characteristics create a social context that can smooth the early stages of engagement, helping users establish rapport before transitioning to richer FtF encounters.

5.2 Challenges of Social VR Mediated Trust

5.2.1 Ambiguities and Fragility of Avatar-Mediated Trust. The first challenge concerns the structural ambiguity of trust formation within social VR itself. Compared to FtF interaction, social VR

offers only a partial palette of communicative cues. Participants repeatedly emphasized that the absence of non-verbal signals such as eye contact, posture, micro-expressions, and subtle facial dynamics which made it difficult to assess sincerity and reliability [25, 75, 82]. As Lucas et al. note, trust judgments are inherently multimodal and depend on integrating these nuanced channels [90]; when such channels are diminished or distorted, trust becomes harder to calibrate. In our study, this reduction in cue richness manifested as delayed and fragile trust [22]. Some participants mentioned they hesitated to fully trust until enough behavioral evidence had accumulated through conversational exchanges, a pattern that aligns with the concept of “delayed trust” in communication with limited bandwidth. Others indicated that although social VR lowered social barriers and enabled rapport-building, the sense of intimacy was tenuous, easily disrupted, and reliant on ongoing verbal reciprocity rather than embodied impressions. This aligns with prior work showing that friendships in social VR may feel “closer than real” yet remain fluid and vulnerable [62]. These inherent ambiguities help explain why FtF interaction still outperforms social VR for trust formation: compared to the abstractions of avatar-mediated communication, FtF interaction involves more direct, concrete cues and is grounded in a well-established system of interpersonal signals, making sincerity and reliability easier to evaluate. As Baker et al. observe, social VR reproduces only a subset of the embodied resources available in person, limiting its stability as a medium for developing durable trust [10].

5.2.2 Complications in Trusting Others Across Contexts. The second challenge concerns the difficulty of recalibrating that trust across contexts. Trust in VR is built on avatars that convey only partial and sometimes strategically curated identity cues. Participants in both the “Similar-Self” and “Alt-Self” conditions reported that once they met their partner FtF, their VR-based impressions felt incomplete, uncertain, or in need of revision. This complication arises because neither form of avatar self-presentation fully expresses the person behind it: “Similar-Self” avatars highlight physical resemblance [19, 119], whereas “Alt-Self” avatars foreground idealized or expressive traits [68], but both surface only selected aspects of the self. Social VR therefore places users in a position of stitching together identity from fragmented visual, vocal, and behavioral signals [46, 119]. These partial cues can sustain early trust in context, but they are fragile when interaction shifts to a medium that supplies many more diagnostic signals. Participants experienced what they described as a “double first impression”: an initial assessment in VR and a second, sometimes dissonant, assessment upon encountering the full embodied person [17]. In some cases, new FtF cues reinforced trust; in others, they prompted recalibration. These patterns are similar to challenges seen in social media, where profiles often reflect different aspects of a person’s identity, such as the actual self, the ideal self, or the ought self [63, 158]. This highlights that trust, which is based on partial or selectively curated identity cues, might easily not remain stable from one context to another (e.g., VR to FtF). The main challenge is that trust across different contexts requires rebuilding the perception of someone’s identity. The cues that create trust in VR may not directly match the cues available in FtF interactions.

5.3 Design Implications for Trustworthy Encounters in Social VR

Building on our reflections in Section 5.1 and the challenges outlined in Section 5.2, we propose two design implications for supporting trustworthy interactions between unacquainted individuals in social VR. As social VR becomes increasingly integrated into settings such as business meetings [59], networking [15], interviews [28], collaboration [46, 125], and online dating [77], trust becomes a critical resource that platforms should actively cultivate. Our findings point toward design strategies that encourage trustworthy interaction not by leaning on avatars alone but by prioritizing structured conversational scaffolds, meaningful responsiveness, expressive embodied cues, and coherent identity signals that support continuity and recalibration of trust when moving between VR and FtF.

5.3.1 Designing for Trustworthy Interaction Beyond Avatar Customization.

Scaffolding Early Trust Through Structured and Playful Interaction. Our study showed that meaningful trust formation was ultimately grounded less in avatar appearance than the quality and progression of interaction. We therefore suggest that social VR systems provide structured openings, such as guided self-disclosure prompts, staged ice-breakers, or lightly scaffolded early exchanges that help users ease into conversation and reduce initial uncertainty [7, 66, 126, 157]. We also recommend that platforms incorporate opportunities for playful or cooperative activity, as such engagements can help users ease into rapport and allow trust to grow more organically over time [11, 125, 137]. By pairing structured prompts with moments of shared play, platforms can better support the gradual deepening of trust while mitigating the fragility of avatar-mediated impressions.

Supporting Trust Through Enhanced Responsiveness in Interaction. At the same time, interaction features must compensate for the reduced richness of non-verbal cues in avatar-mediated environments [106]. Participants in our study frequently relied on conversational responsiveness, such as elaborating on personal experiences, asking follow-up questions, or offering balanced self-disclosure, to assess sincerity in the absence of nuanced facial expressions or micro-gestures. Rather than focusing solely on conversational flow, we recommend that social VR systems support a broader notion of responsiveness that encompasses timely reactions, attentiveness signals, and subtle feedback cues. These may include turn-taking indicators, gentle prompts that sustain reciprocal engagement, adaptive timing cues that help users avoid talking over one another [84], or lightweight mechanisms that enhance mutual sharing of experiences or interests [83, 95]. By reinforcing responsiveness across these multiple modalities, platforms can help users better interpret a partner’s intentions and reliability.

Strengthening Trust with More Expressive Embodied Cues. Finally, enhancing the expressiveness of embodied interaction can further strengthen impressions of engagement and authenticity. Simple gestural signals, such as thumbs-up animations or shared high-five effects, were cited by participants as meaningful interpersonal cues. We suggest expanding the variety of expressive cues in ways that

remain lightweight and context-appropriate, such as adaptive posture indicators or subtle head movement approximations [61, 139]. Enhancing the expressivity of embodied cues may help users read sincerity and emotional tone more reliably, thereby strengthening trust alongside conversational exchange.

5.3.2 Avatar Identity Strategies that Support FtF Continuation.

Ensuring Trust Through Coherence in Avatar and Identity. Because participants often treated voice as a more stable indicator of integrity than avatar appearance, we suggest prioritizing designs that maintain coherence between auditory and visual identity cues. Aligning voice and appearance whether realistic or stylized can reduce the uncertainty observed when mismatches created ambiguity [32, 74, 94, 149]. At the same time, strict realism is neither necessary nor universally desired; users value the expressive and inclusive possibilities of stylized or alternative avatars [68], and realism does not inherently increase trust [28, 119]. We therefore recommend offering flexible avatar customization while making optional authenticity signals such as consistent naming conventions or verification badges [87] available for contexts where trust continuity across VR and FtF matters.

Supporting the Retention of Trust Across Contexts. Although trust judgments formed in VR could inform the initial FtF encounter, they often required consolidation or recalibration once richer cues became available. To support this transition, we suggest implementing continuity mechanisms that help stabilize impressions across contexts. These might include staged identity reveals, persistent but privacy-respecting conversational histories, or subtle carryover indicators that remind users of shared past interactions [44, 69, 111]. Platforms might also consider pairing unacquainted users based on shared interests or goals, as conversational continuity was an important factor in helping trust deepen once the interaction moved offline [110]. Such mechanisms may reduce the fragility of VR-initiated trust and encourage longer-term relationship building across contexts.

Safeguarding Trust to Prevent Misuse and Manipulation. Finally, because the same features that support trust can also be exploited to manipulate or deceive, we argue that social VR systems should include safeguards that ensure trust is earned rather than engineered [160]. Transparency prompts, clear indicators when identity-altering tools are in use, and user-controlled visibility settings can help prevent misuse of persuasive affordances [18, 128]. Such protections are important not only within VR but also for interactions that may later transition into FtF contexts, where users may rely on VR-formed impressions to guide offline judgments. Incorporating these safeguards is therefore essential for creating environments in which trust can develop safely and where users retain control over how they present themselves and interpret others across both virtual and physical settings.

5.4 Limitations and Future Work

Our study has several limitations that also point towards opportunities for future research on avatar-mediated trust formation. First, the controlled laboratory setting and short, low-stakes interactions capture only early-stage, episodic trust rather than the

dynamics of long-term or risk-bearing relationships. Future research should examine trust in more naturalistic and enduring VR encounters, incorporate higher-stakes interdependence, and adopt implicit and unobtrusive trust measures to reduce demand effects. As highlighted in our design implications that social VR is used increasingly across diverse contexts, future work should also investigate how trust develops and is maintained across varying social, professional, and collaborative settings, and how design strategies may need to adapt accordingly.

Second, the sample consisted of demographically homogeneous Chinese young adults, most of whom were students with limited social VR experience. This restricts generalizability of our findings across cultural backgrounds, age groups, and VR literacy. Additionally, gender composition was not examined due to insufficient statistical power, and individual differences, such as personality traits or prior online-to-offline experiences, may have influenced trust trajectories but were not fully explored. Moreover, our study focused solely on dyadic interactions and included only a one-week follow-up, while trust in real-world contexts often unfolds in longer-term, multiparty, and hierarchically structured settings. Future research should recruit more diverse and balanced samples, consider gender and personality as analytic factors, and adopt longitudinal or multiparty designs to better capture how avatar-mediated trust forms, transfers, and stabilizes across social contexts.

Third, several procedural and methodological features may have introduced asymmetries across conditions. The fixed VR-to-FtF sequence by design to examine trust transfer across contexts constrained our ability to separate effects specific to each interaction context from those stemming from familiarity or repeated exposure. Additionally, the pairing of participants was fixed with the same avatar customization condition, limiting the scope for examining mixed combinations of avatar types. Future research could consider more varied pairing combinations, such as mixing “Alt-Self” and “Similar-Self”, and exploring different sequence orders (e.g., VR-to-FtF or FtF-to-VR) to examine how these factors influence trust development and transfer across contexts. The mirror was present only in the “Similar-Self” condition during avatar creation, and this may have momentarily heightened participants’ self-awareness [40, 120]. Future work should more carefully structure these procedural aspects to better isolate contextual influences on trust and to minimize potential confounds introduced during avatar customization. Our manipulation also bundled appearance and voice (self-similar avatars with unmodified voices vs. alternative avatars with voice changers), and the limited expressiveness due to headset and tracking constraints restricted access to fine-grained non-verbal cues such as facial expressions or micro-gestures. Future research could incorporate richer or custom VR environments with factorial manipulations to help isolate the multi-modal contributions to trust. Furthermore, the present study examined only two avatar conditions; subsequent work could follow up by exploring abstract, non-human, or highly stylized avatar forms to better understand how different representational strategies shape trust dynamics across hybrid social VR-FtF encounters.

6 Conclusion

This paper examined how avatar customization shapes trust formation between unacquainted individuals in social VR and how that trust transfers into FtF interaction. Through a mixed-methods study with 48 participants, we identified the following key findings: (1) “Similar-Self” avatars improved initial impressions of integrity, but trust development during VR was driven primarily by reciprocal conversation and stable vocal cues rather than avatar appearance, (2) for both conditions, trust formed in VR largely carried into the FtF meeting, with participants treating the in-person encounter as a continuation of their VR interaction and showing further increases in trust once richer cues became available, and (3) while trust tends to consolidate in richer FtF contexts, VR serves as a valuable pre-stage for reducing social barriers and building toward deeper connections. These findings suggest that while avatar customization influences first impressions, interaction quality and identity coherence also play a important role in shaping the trajectory of trust. We outlined design implications for supporting trustworthy encounters in social VR, emphasizing conversational scaffolding, expressive responsiveness, continuity across contexts, and safeguards around identity alteration. We hope this work could offer insights for future HCI research and system design aimed at fostering meaningful and trustworthy connections in social VR and beyond.

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A Prompts for Interaction

Table 5: Prompts for interaction, including icebreaker, structured conversation, and notes

Context	Icebreaker	Structured Conversation
VR	Begin by sharing and discussing three things you and your partner appear to have in common.	Would you like to be famous? In what way? If you could wake up tomorrow having gained any one quality or ability, what would it be? What is one of your most meaningful memories? Why is it meaningful to you?
FtF	If you could go anywhere in the world, where would you want to go?	What is the greatest accomplishment of your life? What does friendship mean to you? Is there something that you've dreamed of doing for a long time? Why haven't you done it?

B Questions in Semi-Structure Interview and Follow-up Survey

Table 6: Questions in semi-structure interview after VR and FtF encounter, and in follow-up survey

Context	Topics	Questions
VR	Avatar Customization	Can you describe your thought process when creating your avatar's appearance (and voice, if applicable)? To what extent did you feel connected to your avatar during the interaction? Why or why not?
	Post-VR Trust Formation	What was your initial impression of your partner when you encountered their avatar? What aspects of your partner's avatar or behavior made you trust them more (or less)?
FtF	VR-to-FtF Trust Development	Did anything change in your perception of your partner after meeting them in person? If so, what and why? How did face-to-face interaction compare to VR in terms of trust, openness, or communication style?
	Reflections on Trust Building	If you were designing a social VR experience to foster trust, what would you include or avoid? What would help maintain or strengthen the trust you built from VR? Any tips for people choosing avatars or voices to create positive first impressions?
Follow-up		How do you feel about your partner now, compared to right after the study? Has your impression changed? Have you had any contact with your partner since the previous sessions? Do you want to meet this person again? Why? Looking back, what made the strongest impression on you about your partner?

C Post-Hoc Results

Table 7: Post-hoc pairwise comparisons (Holm-Bonferroni corrected) for main effects on Behavioral Trust.

DV	Effect	Contrast	Estimate	SE	df	p
Behavioral Trust	Avatar Condition	Similar-Self vs. Alt-Self	5.94	9.23	46	.523
		Post-VR vs. Post-FtF	-21.83	6.22	92	.002**
	Interaction Stage	Post-VR vs. Follow-up	-22.04	6.22	92	.002**
		Post-FtF vs. Follow-up	-0.21	6.22	92	.973

Note. * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

Table 8: Post-hoc pairwise comparisons (Holm-Bonferroni corrected) for main effects on Explicit Trust, Integrity, Benevolence, and Competence.

DV	Effect	Contrast	Estimate	SE	df	p
Explicit Trust	Avatar Condition	Similar-Self vs. Alt-Self	27.60	15.90	46	.090
		Pre-VR vs. Post-VR	-60.42	8.33	184	< .001***
		Pre-VR vs. Pre-FtF	-54.62	8.33	184	< .001***
		Pre-VR vs. Post-FtF	-98.77	8.33	184	< .001***
		Pre-VR vs. Follow-up	-81.60	8.33	184	< .001***
	Interaction Stage	Post-VR vs. Pre-FtF	5.79	8.33	184	.488
		Post-VR vs. Post-FtF	-38.35	8.33	184	< .001***
		Post-VR vs. Follow-up	-21.19	8.33	184	.035*
		Pre-FtF vs. Post-FtF	-44.15	8.33	184	< .001***
		Pre-FtF vs. Follow-up	-26.98	8.33	184	.006**
Integrity	Avatar Condition	Similar-Self vs. Alt-Self	44.10	15.20	46	.006**
		Pre-VR vs. Post-VR	-53.96	9.06	184	< .001***
		Pre-VR vs. Pre-FtF	-50.15	9.06	184	< .001***
		Pre-VR vs. Post-FtF	-80.92	9.06	184	< .001***
		Pre-VR vs. Follow-up	-69.56	9.06	184	< .001***
	Interaction Stage	Post-VR vs. Pre-FtF	3.81	9.06	184	.674
		Post-VR vs. Post-FtF	-26.96	9.06	184	.017*
		Post-VR vs. Follow-up	-15.60	9.06	184	.260
		Pre-FtF vs. Post-FtF	-30.77	9.06	184	.005**
		Pre-FtF vs. Follow-up	-19.42	9.06	184	.134
Benevolence	Avatar Condition	Similar-Self vs. Alt-Self	19.70	16.90	46	.248
		Pre-VR vs. Post-VR	-55.10	8.08	184	< .001***
		Pre-VR vs. Pre-FtF	-41.46	8.08	184	< .001***
		Pre-VR vs. Post-FtF	-83.77	8.08	184	< .001***
		Pre-VR vs. Follow-up	-61.65	8.08	184	< .001***
	Interaction Stage	Post-VR vs. Pre-FtF	13.65	8.08	184	.186
		Post-VR vs. Post-FtF	-28.67	8.08	184	.003**
		Post-VR vs. Follow-up	-6.54	8.08	184	.419
		Pre-FtF vs. Post-FtF	-42.31	8.08	184	< .001***
		Pre-FtF vs. Follow-up	-20.19	8.08	184	< .040*
Competence	Avatar Condition	Similar-Self vs. Alt-Self	15.00	16.50	46	.367
		Pre-VR vs. Post-VR	-48.90	8.81	184	< .001***
		Pre-VR vs. Pre-FtF	-53.10	8.81	184	< .001***
		Pre-VR vs. Post-FtF	-82.90	8.81	184	< .001***
		Pre-VR vs. Follow-up	-61.56	8.81	184	< .001***
	Interaction Stage	Post-VR vs. Pre-FtF	-4.21	8.81	184	.676
		Post-VR vs. Post-FtF	-34.00	8.81	184	.001**
		Post-VR vs. Follow-up	-12.67	8.81	184	.456
		Pre-FtF vs. Post-FtF	-29.79	8.81	184	.004**
		Pre-FtF vs. Follow-up	-8.46	8.81	184	.676
		Post-FtF vs. Follow-up	21.33	8.81	184	.066

Note. * $p < .05$, ** $p < .01$, *** $p < .001$.