

The Influence Mechanism of Physical Fitness APP Users' Sense of Presence on Continuous Use Intention


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Received: June 2nd, 2025 | **Accepted:** October 14th, 2025

ABSTRACT

Driven by the recent pandemic and rapid network technology advances, sports and fitness apps have become widely popular. The combination of sports and social features is now a key driver of user participation in online fitness activities. Online telepresence has also received increasing attention from scholars, leading to different viewpoints on its impact on user behavior. This study, grounded in Stimulus-Organism-Response theory and relevant telepresence research, develops a model to examine how users' sense of presence affects their intention to continue using these apps and tests it empirically. The findings show that presence within sports and fitness apps significantly enhances continuous use intention, with trust fully mediating this relationship. Moreover, potential performance and involvement moderate the influence of spatial and social presence on user trust. These insights highlight the importance of individual psychological perceptions in decision-making and offer guidance for improving interactive design and social functions in future sports and fitness apps.

KEYWORDS

S-O-R Framework, Presence, Involvement, Potential Performance, Physical Fitness

INTRODUCTION

The Healthy China Initiative (2019–2030) emphasizes national fitness, and increasing public investment in sports reflects the growing integration of fitness into daily life. Recent government releases underscore the policy urgency and population-level scale of insufficient physical activity: in 2022, about 31% of adults worldwide, approximately 1.8 billion people, did not meet recommended activity levels (WHO, 2024), and national guidelines continue to call for at least 150 minutes of moderate activity weekly (CDC, 2024). China has also announced new actions to promote fitness-for-all by expanding sports events and venues (State Council, 2024). These authoritative statistics and policies substantiate the social importance of scalable, technology-enabled solutions.

DOI: 10.4018/IJOM.398367

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With the evolution of mobile technology, fitness apps are playing a pivotal role in shaping this transformation, merging sports and the Internet to promote the digitalization of fitness behaviors. The COVID-19 pandemic further increased the need for home fitness, leading to widespread adoption of mobile fitness applications. Against this backdrop, identifying which mechanisms sustain usage is not merely descriptive but decision-relevant for public-health goals and industry design choices.

Recent studies indicate that fitness apps can foster an immersive experience for users. In this paper, we define presence as the psychological sense of “being there” in a mediated environment—the perceptual illusion of nonmediation (Lombard & Ditton, 1997). Leveraging artificial intelligence and interactive technologies, these platforms provide personalized course recommendations through big data analysis. Such features can enhance user engagement and create tailored exercise environments. Social functions, including community features, leaderboards, and peer feedback, are associated with higher user retention. Beyond general engagement effects, emerging work shows that augmented-reality affordances intensify the sense of “being there” (spatial presence) and, in turn, support continuance intentions in fitness contexts (Sun & Yuan, 2024). In line with these findings, recent studies on mobile fitness and social augmented reality applications show that incentive/social mechanisms and shared presence cues are associated with higher continuance intention (Faizah et al., 2024; Wang et al., 2023). In this study, presence functions as the stimulus within a Stimulus-Organismic-Response (S-O-R) account, with trust as the organismic state and continuance intention as the behavioral response. Clarifying this mechanism is substantive because presence cues are widely deployed in practice, yet their downstream psychological pathway—via trust—to continuance remains under-specified for fitness apps. What remains unclear is whether trust operates as a full rather than partial mediator in this context, how spatial versus social presence differentially feed into trust, and under what conditions the presence-to-trust link strengthens or weakens.

However, despite these advancements, the “homogenization” of product functions remains a critical issue in the fitness app industry. Most existing platforms focus on similar features, limiting differentiation in user experience and hindering innovation. Content-analytic evidence shows convergence in feature bundles: a study of 98 iPhone fitness apps identified four recurrent clusters—Tutor, Recorder, Game Companion, and Cheerleader—with tracking as the predominant function and frequent co-occurrence of personalized planning, gamification, and social elements (Wang & Collins, 2021). Review and meta-analytic evidence likewise highlight the ubiquity of gamification and social feedback in health/fitness apps, frequently treating these as standard design levers for engagement and continuance. (Mazeas et al., 2022; Chen, Carl, & Hinz, 2025). Beyond functional overlap, there is a theory-driven gap: existing research often optimizes features but insufficiently explains how experiential mechanisms translate into trust and continuance, especially via spatial and social presence (Wang et al., 2024; Sun & Yuan, 2024). Current research on fitness apps has largely concentrated on functional optimization rather than exploring the psychological dimensions of user interaction (Tsilimigkras et al., 2024). While it is recognized that immersive interfaces can improve user satisfaction, few studies investigate the psychological constructs of spatial presence and social presence in fitness apps (Zhang et al., 2025). Recent reviews and meta-analyses likewise document fragile engagement in physical-activity and fitness-app settings and call for clearer accounts of continuance mechanisms (Grady et al., 2023; He et al., 2024; Chen et al., 2025). Against the backdrop of feature homogenization and fragile engagement, prior work has not established whether presence-evoked experience translates into continuance primarily through trust in fitness apps, nor whether this pathway differs between spatial and social presence. It remains unknown when this mechanism is stronger—namely, whether user-level potential performance (goal-instrumental beliefs) and involvement (personal relevance) condition the presence-to-trust link. This study addresses these gaps by testing a mediation-and-moderation model in the fitness-app context, and is significant in four ways. First, theoretically, we adopt the S–O–R framework and treat spatial and social presence as stimuli that shape the organismic state of trust, which in turn drives continuance. Second, substantively, we identify when presence is effective by modeling potential performance and involvement as boundary

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