



Designing a Conversational Exercise Coach for Aging Adults: Engagement, Motivation, and Interaction

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Motivation

Staying physically active is critical for healthy aging, yet many older adults struggle to maintain exercise motivation without social support or clear guidance. Socially interactive robots offer a new way to encourage participation by combining companionship, structure, and accountability. In this work, we examine how two robot personalities, a friendly social buddy and a structured exercise coach, shape engagement and preference across repeated exercise sessions with older adults. Our goal is to understand how interaction style affects comfort, motivation, and ongoing willingness to exercise.

Research Questions

RQ1: Do older adults prefer to exercise with a social buddy type system or an exercise coach type system?

RQ2: Do their preferences change over time as they become more familiar with the system?

RQ3: Does exercising with either type of system personality motivate older adults to continue returning for future exercise sessions?

Methods

Participants: Three older adults (61 to 80, 3F), up to four weekly sessions each

Robot: Pepper with wireless mic and transcription, GPT for social condition dialogue



Design: Within-subjects. Intro + two exercise rounds (bicep curls, lateral raises), counterbalanced order

Conditions:

- **Social Buddy:** conversation, casual tone, robot exercises with participant
- **Coach:** structured guidance, corrective feedback, no free conversation

Measures: RoSAS, LCES, open-ended feedback

Analysis: Survey comparison and thematic review of comments

Preliminary Results

Older adults responded best when the system combined structured coaching with the flexibility to adjust social tone as they exercised and grew more familiar with the robot

- Participants increasingly leaned toward the coach style as sessions progressed, but still expressed a desire to shift between social and directive support depending on energy and mood
- Initial awkwardness and timing challenges gave way to smoother interaction, suggesting familiarity and repeated exposure help build comfort and trust with the system
- Warmth and comfort perceptions trended upward while competence remained steady, pointing toward the promise of systems that can adapt tone and behavior over time to maintain motivation and engagement

Future Work

- Large scale longitudinal study at an assisted living facility (ongoing)
- Scale participant pool and include broader mobility and health profiles
- Build an adaptive system that can shift between social and coaching styles based on user state and context