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Psychological Heterogeneity in User Preferences of Real-Time AI Mediation as Cognitive Scaffolds: A Latent Class Analysis

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Abstract

User studies of AI-mediated communication typically report average effects, while interview-based work remains dominated by thematic narrative or Likert clustering, leaving the structured heterogeneity expressed in post-task interviews unquantified. We applied latent class analysis as a methodological bridge that converts qualitative interview codes into discrete, domain-specific user profiles, enabling design reasoning about *for whom*, *on which dimension*, and *under what conditions* real-time AI scaffolds help or burden. As a validating scenario, 29 non-native English speakers interacted with XPLAIN, a Wizard-of-Oz proactive scaffold in Zoom's sidebar, to bridge gaps in linguistic and cultural knowledge during a collaborative task. Across eight thematic domains, two-class solutions were consistently best-fitting (BIC); class membership was largely independent across domains, indicating multi-dimensional rather than global user types (e.g., longer English immersion was associated with more direct, interlocutor-focused repair strategies). Quantifying such heterogeneity, we argue, is critical for user-adaptive, timing-sensitive AI-mediation design.