

## Quantifying User-Related, System-Related, and Context-Related Patterns of Smartphone Use

**Authors :** Andrew T. Hendrickson, Liven De Marez, Marijn Martens, Gytha Muller, Tudor Paisa, Koen Ponnet, Catherine Schweizer, Megan Van Meer, Mariek Vanden Abeele

**Abstract :** Quantifying and understanding the myriad ways people use their phones and how that impacts their relationships, cognitive abilities, mental health, and well-being is increasingly important in our phone-centric society. However, most studies on the patterns of phone use have focused on theory-driven tests of specific usage hypotheses using self-report questionnaires or analyses of smaller datasets. In this work we present a series of analyses from a large corpus of over 3000 users that combine data-driven and theory-driven analyses to identify reliable smartphone usage patterns and clusters of similar users. Furthermore, we compare the stability of user clusters across user- and system-initiated sessions, as well as during the hypothesized ritualized behavior times directly before and after sleeping. Our results indicate support for some hypothesized usage patterns but present a more complete and nuanced view of how people use smartphones.

**Keywords :** data mining, experience sampling, smartphone usage, health and well being

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