Typical Phone Use Habits:
Intense Use Does Not Predict Negative Well-Being

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Barcelona, Spain

"Phone addiction is real, and so are its mental health risks"
Forbes, December 2017

"How phones are tearing us apart"
Psychology Today, June 2015

Research Question:

Is phone addiction something that stands out from normal use in terms of phone use patterns?

If yes, how does it differ?

Data Collection

- Study with 340 participants, collecting mobile sensor data for ~4 weeks.

- Experience sampling questionnaire (right), using 10-15 notifications per day.

- In addition, we collected:

  - Big Five Personality Test

  - Personal Health Questionnaire Depression Scale (PHQ-8)

  - Boredom Susceptibility Scale (SSS-BS)

Experience sampling questionnaire

Features

- Number of sessions (Day, Night)

- Duration of sessions (Day, Night)

- Number of Incoming / Outgoing calls (Day, Night)

- Duration of Incoming / Outgoing calls (Day, Night)

- Number of App Launches (Day, Night) for:
  Email, Messaging, Social and Game apps

- Total data usage (Rx)

- Photos taken

- Battery drain level

- Fraction of Ringer mode (Normal, Silent, Vibrate)

Unsupervised Learning

- K-means (#clusters)

- Agglomerative (#clusters, linkage type, affinity)

- Spectral (#clusters, kernel type)

- DBScan (neighbourhood size, min samples)

- Mean-shift (bandwidth)

- Gaussian Mixtures (#components, covariance type, convergence threshold)

Measuring Cluster Validity

Algorithm	Rule	Algorithm	Rule
Banfeld Raftery	*min*	Point Biserial	*max*
C index	*min*	Davies-Bouldin	*min*
Dunn	*max*	Ray-Turi	*min*
Gamma	*max*	SD-Scat	*min*
log(BGSS/WGSS)	*min diff*	Silhouette	*max*
McClain-Rao	*min*	Xie-Beni	*min*
PBM	*max*		

13 internal validity criteria used in a Rank Aggregation approach

Winning clustering configuration:
 > Spectral, with '*rbf*' kernel and k=5.

A Proposed Taxonomy of Mobile Phone Users
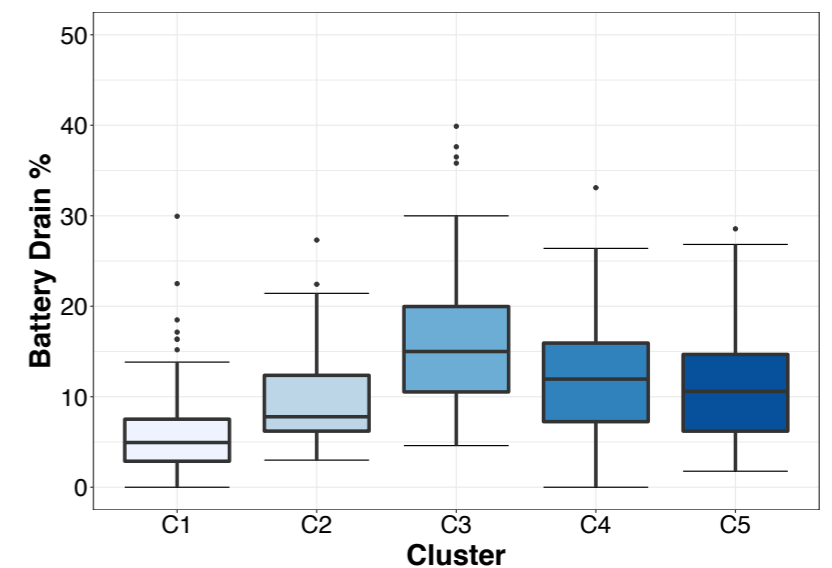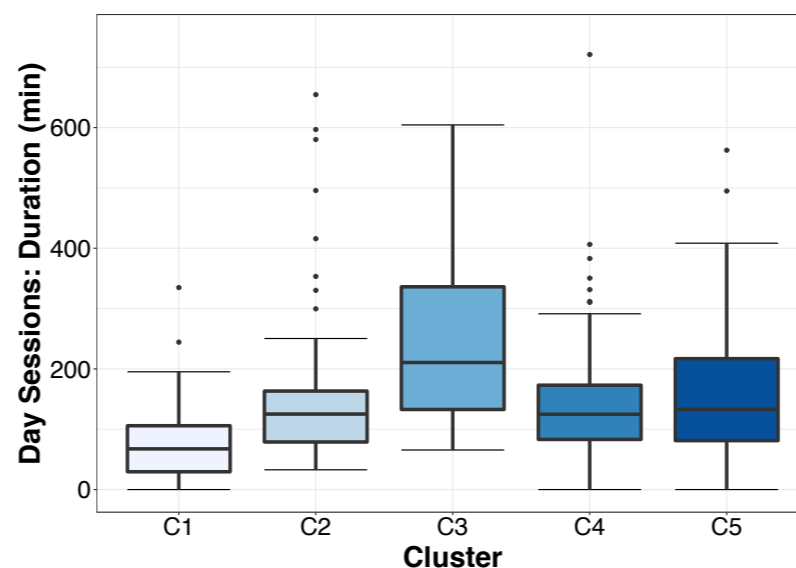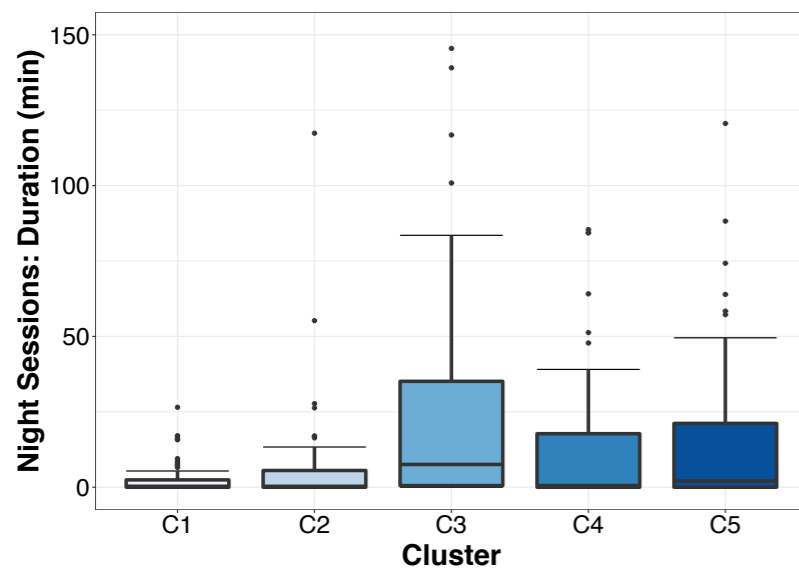
C1: Limited Use

C2: Business Use

C3: Power Use

C4: Personality-Induced Problematic Phone Use

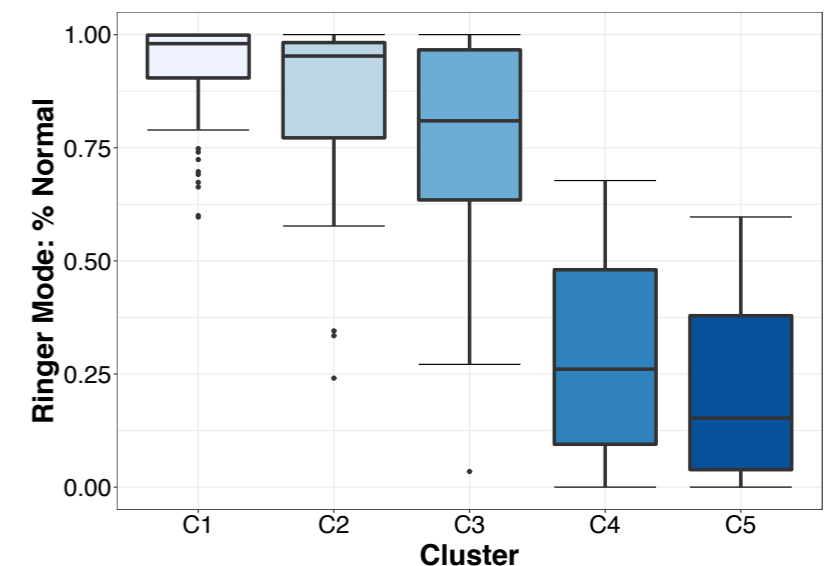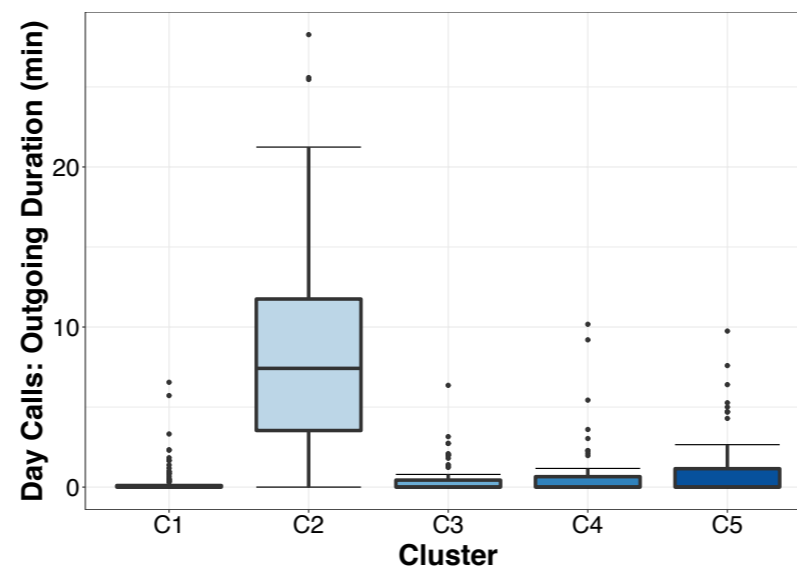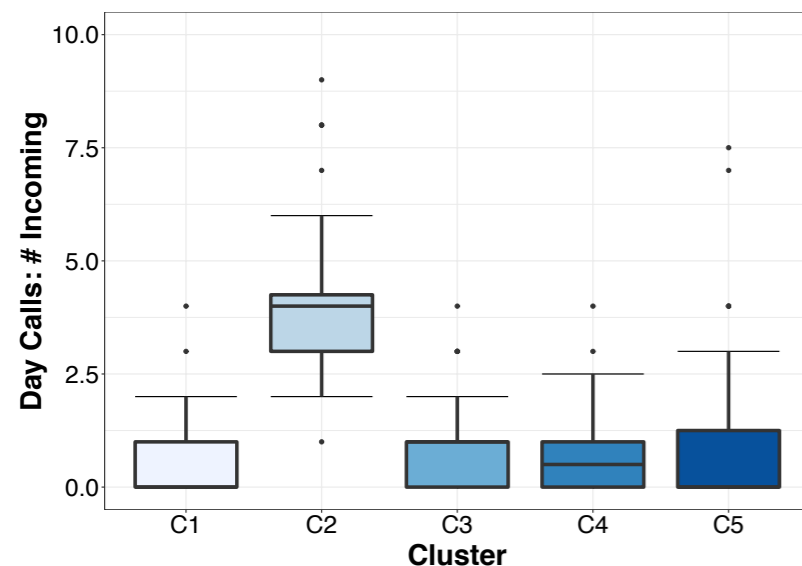**C5:** Externally-Induced Problematic Phone Use

C1: Limited Use

- Scored low in almost all usage categories.

- Ringer mode is set to normal.

- We used this cluster as a Baseline.

C2: Business Use

- Increased use of phone calls.

- Fewer nightly use sessions and app launches.

- Ringer mode is set to normal.

- Higher levels of boredom during weekend.

C3: Power Use

- Increased session duration, number of nightly sessions, battery use, and mobile data use.

- Increased app launches during the day (e-mail, game and social media apps).

- Decreased use of messaging apps during day.

- Highest use of email apps and increased use of messaging apps during night.

- Ringer mode is set to normal (high variance)

C3: Power Use

- No negative well-being related factors.

- More awake during weekend.

- Lower levels of boredom during the night.

- Lower levels of depression (PHQ-8) and neuroticism (Big5) compared to C4.

C4: Personality-Induced Problematic Phone Use

- Increased number and duration of sessions during night.

- Increased use of email and messaging apps during night.

- Ringer mode is set to silent.
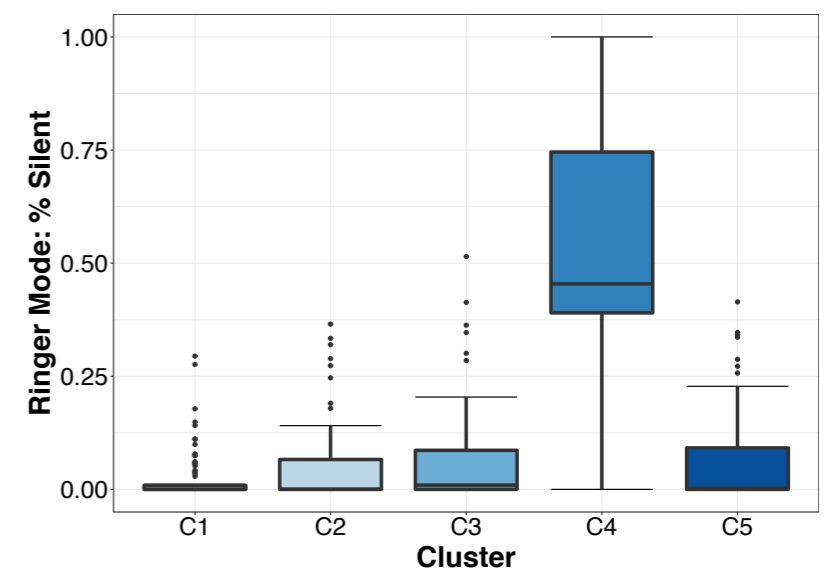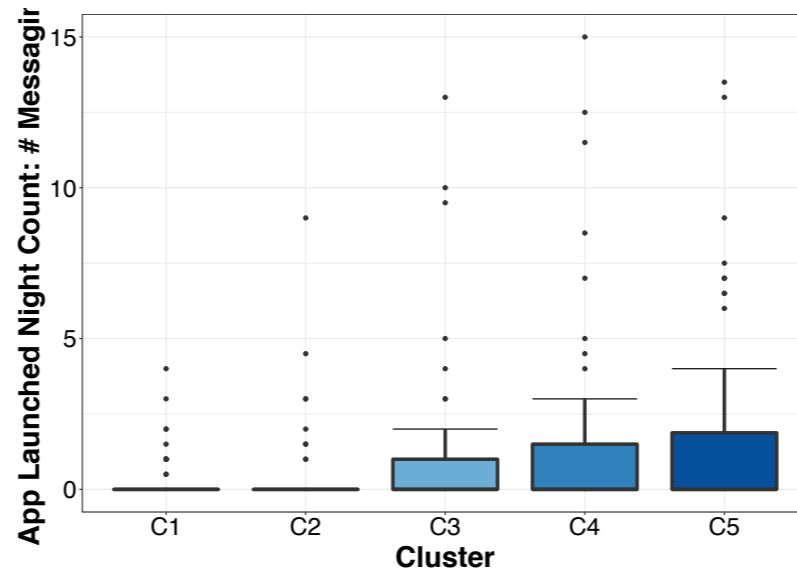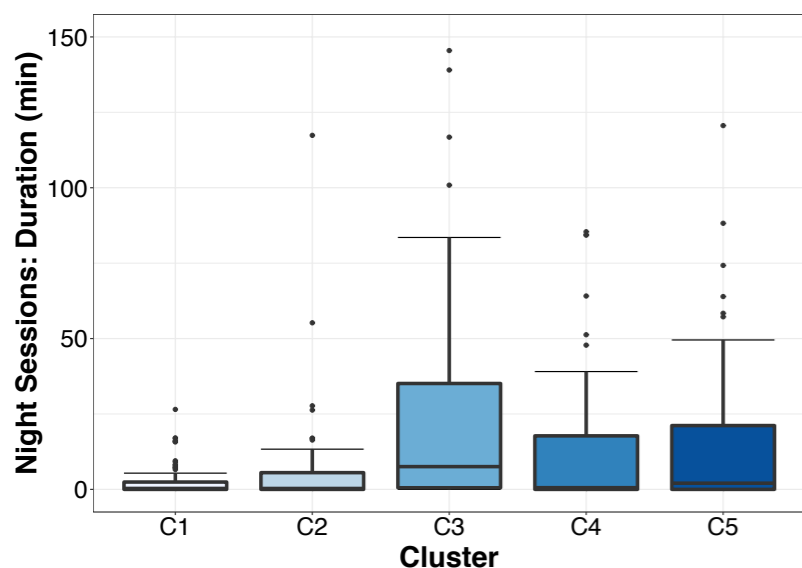
C4: Personality-Induced Problematic Phone Use

- Higher levels of tense-arousal, boredom, lower valence.

- Effects of tense-arousal and valence disappeared when accounting night-time and non-working days.

- Boredom was lower during night-time.

- Members appeared to be more neurotic and less emotionally stable.

- Higher PHQ-8 compared to Limited (C1) and Power (C3) users.

C5: Externally-Induced Problematic Phone Use

- Very similar to C4.

- During night-time, only messaging apps is comparably higher and email apps is lower.

- Ringer mode is set to vibrate.
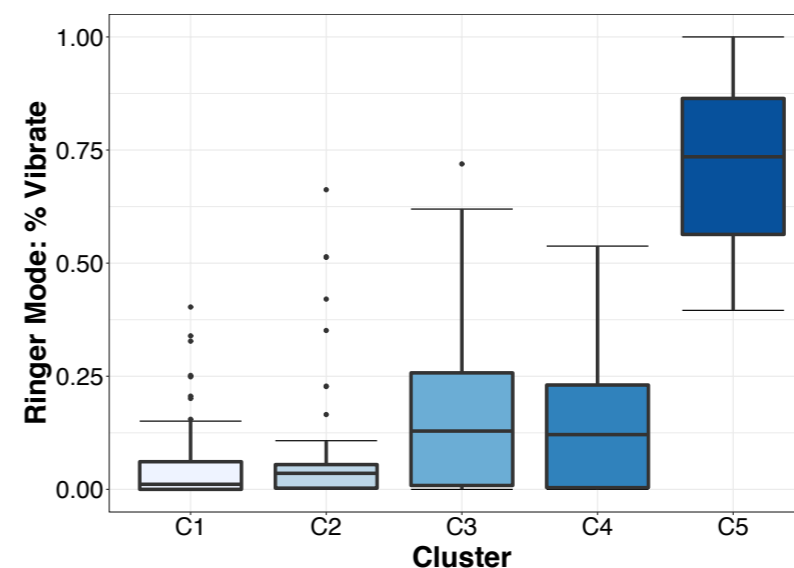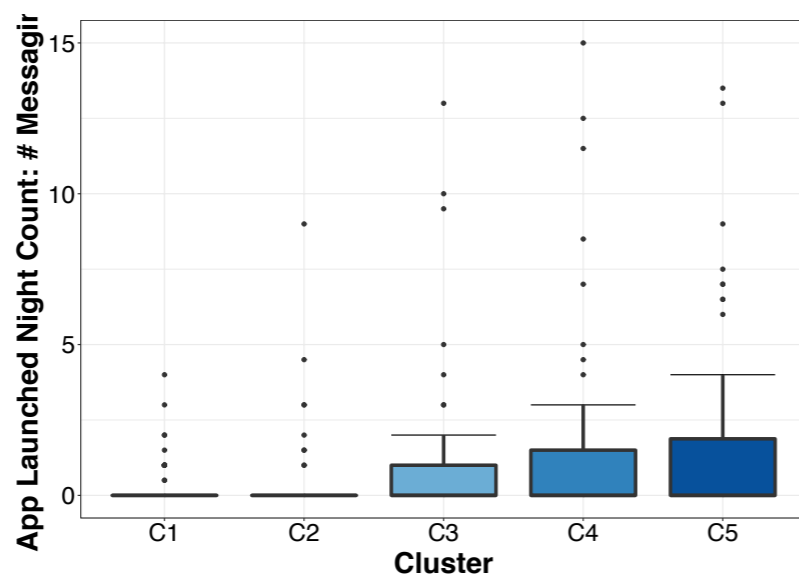
C5: Externally-Induced Problematic Phone Use

- Higher tense-arousal, lower energetic arousal, lower valence, and higher levels of boredom.

- Energetic arousal was lower during night.

- Tense-arousal was lower, valence was higher, and significant effects on energetic arousal and boredom disappeared during weekend.

- More emotionally stable compared to Limited (C1) and C4 users.

- Higher PHQ-8 compared to Limited (C1) users.

Conclusions

- Heavy phone use does not predict negative well-being.

- Typical habits such as *nightly phone use sessions* and *not having the ringer mode in 'normal'* are associated with problematic phone use and increase score in depression (PHQ-8) scale.

- Need for further research to study and understand the underlying mental problems without falling into the old moral "new technology is bad" panic.
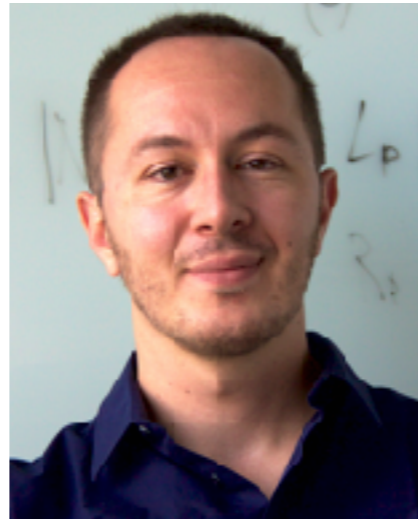
Source: techdirt.com

"New tech 'addictions' are mostly just old moral panic"
Engadget UK, February 2018

Dominant Types of Mobile Phone Use

Kleomenis
Katevas

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