



I don't want to miss a thing

Why we cannot keep our fingers off our smartphones

**A psychological study by the
Universities of Würzburg and Nottingham Trent
for Kaspersky Lab**

Hate when your friends are having fun without you? Don't worry, it's just FOMO.

If you're waiting for a friend, a colleague or even a doctor's appointment, how long do you think it takes before you check your phone – two minutes? Three? An experiment conducted on behalf of Kaspersky Lab by the Universities of Würzburg and Nottingham Trent found that participants left in a waiting room on their own lasted an average of just 44 seconds before touching their smartphones. Men couldn't even manage half of this time, waiting an average of only 21 seconds compared to women at 57 seconds.

To delve deeper into our companionship on digital devices, after ten minutes participants were asked how long they thought it had been before they reached for their phone. Most said between two and three minutes, highlighting a significant disconnect between perception and actual behaviour.

Additional research conducted by the universities suggests that this compulsion to check our phones could be as a result of fear of missing out (FOMO) on something when not online. In an accompanying survey, participants that used their phones more intensely admitted to a higher level of FOMO.

The study also found that the more we use our phones, the more stressed we become. But surprisingly, when participants were asked about their overall happiness there was no difference between light and heavy users. So the stress caused by smartphone usage does not seem to have a major influence on our well-being in general.

During the 10-minute waiting session, participants used their smartphone on average for almost half the time (five minutes). As previous research by Kaspersky Lab demonstrated, we rely heavily on mobile devices these days as an extension of our brains, using them as tools so we don't have to remember facts anymore. The majority of respondents, for example, could not remember their current partner's phone number but could still recall their home number from when they were ten.

Research Methodology

Laboratory Experiment

Sample

The experiment was conducted in Würzburg (Germany) and in Nottingham (United Kingdom). Therefore, our sample is binational (GER: 59, UK: 36). Overall, 95 participants (56 female and 39 male) took part, varying in age from 19 to 56 years ($M = 27.97$, $SD = 8.01$). Care was taken to balance the experimental conditions and gender across laboratory sites.

We recruited participants within a data collection period of two weeks from 5 April - 29 April, 2016 via online advertisements (e.g. Ebay classifieds) and social media platforms (e.g. Facebook, Google+). A compensation of at least 15€ (Wuerzburg) or £10 (UK) was advertised for one hour of participation. The participation was voluntary and based on ethical guidelines.

Procedure

Participants were invited to professional laboratory facilities at the Universities of Wuerzburg (Germany) and Nottingham Trent (England). Participants were guided by a researcher who followed an experimental procedure with a detailed script, to ensure that each participant was addressed similarly and encountered identical instructions.

Online Survey

Our online study focused on the meaning/importance the smartphone carries as well as the relationship and the emotional connection users feel they have with their smartphones.

Sample

We recruited participants over a period of three months (February to April 2016) via online advertisements (e.g. Ebay classifieds), social media platforms (e.g. Facebook) and mailing lists. The resulting overall sample consisted of **1215 participants** ranging in age from **15 to 83 years** (*mean age* = 28.6, *standard deviation* = 9.09)¹, from a variety of countries with a distinct focus on Germany and the

¹In the following, mean values will be denoted by *M*, standard deviations by *SD*.

United Kingdom. **Female respondents were in a two-thirds majority** and **the overall level of education amongst participants was high**. The majority were students and employees with a university degree.

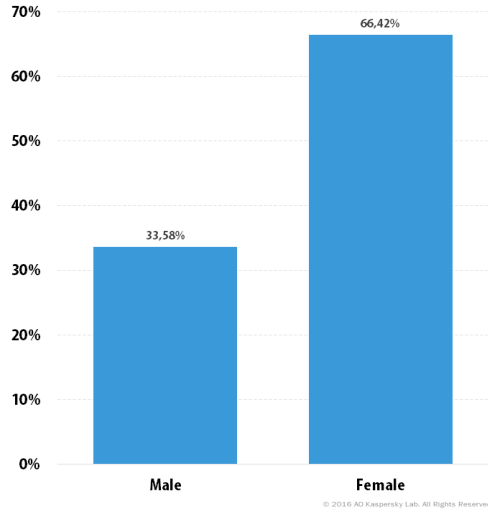


Figure 1: Participants by gender

The participants' age groups

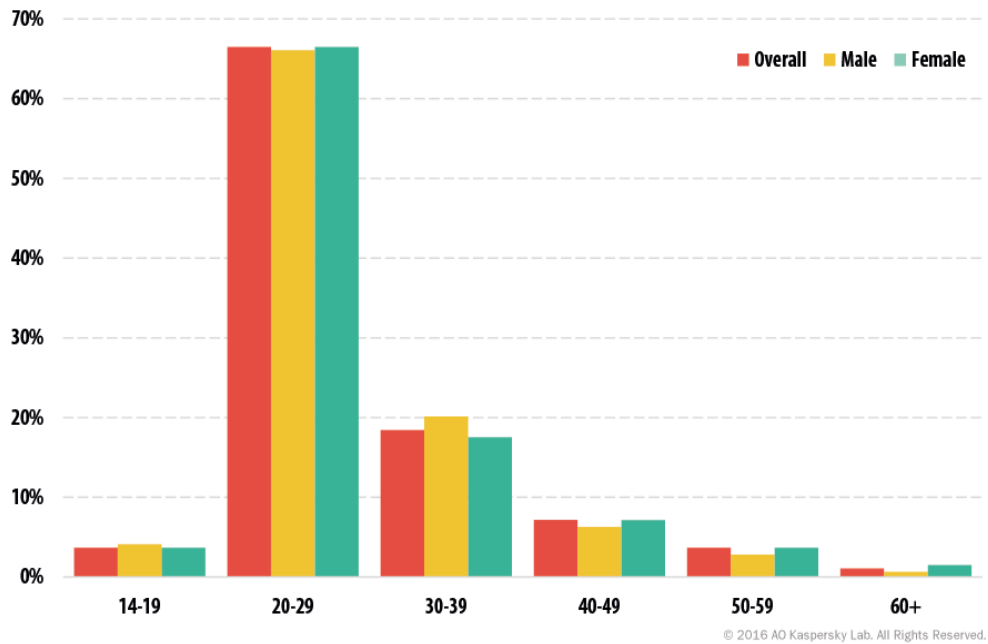


Figure 2: Frequency of participants by age group, asking "How old are you?"



Figure 3: Number of participants by origin; most participants from Germany (808), UK (148) and USA (33)

According to age groups most participants were students, more than 400 were employees

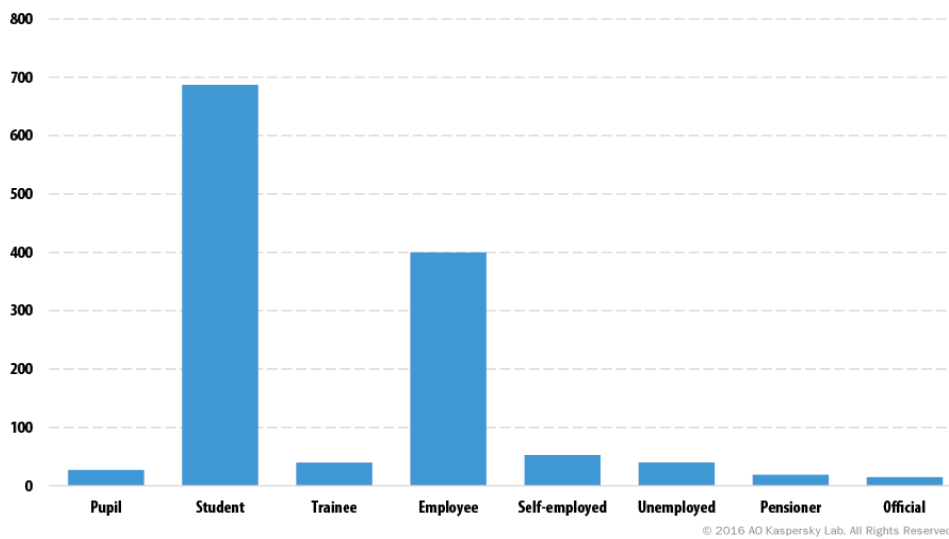
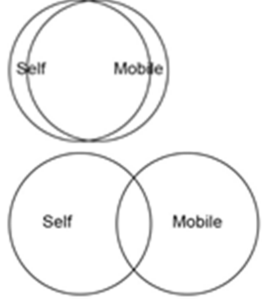


Figure 4: Number of participants by occupation, asking “What is your occupation?”

Procedure and instruments

Participation in the survey was entirely voluntary. The survey study followed core ethical principles based on the Declaration of Helsinki. Participants were asked to engage in self-reports and responses to set tasks. The central variables are as follows:

Instrument: title and authors	Example Item
<p>Oxford Happiness (Hills & Argyle, 2002) Overall happiness in terms of subjective well-being.</p>	<p>I am well satisfied with everything in my life.</p>
<p>Fear of missing out (Przybylsky, Murayama, DeHaan & Gladwell, 2013) The fear of missing out on positive experiences others presumably have (online) while being offline. As a consequence, the instrument captures the desire to stay continually connected with peers - easily possible via one's smartphone.</p>	<p>I get worried when I find out my friends are having fun without me.</p>
<p>Involvement with your mobile phone (Walsh, White, Cox & Young, 2011) An index of the strength of connection with one's mobile phone in cognitive terms (e.g. thinking about the phone when not using it) and behavioral terms (e.g. constantly checking the phone for messages).</p>	<p>I interrupt whatever else I am doing when I am contacted on my mobile (conflict with other activities).</p>
<p>Trust in your mobile phone (based on: Rempel, Holmes & Zanna, 1985) An adapted version of the "Trust in Close Relationship Scale" originally designed to gauge levels of trust in one's relationship partner (e.g. the willingness to rely on the partner being confident that they will satisfy the expectations). We focused on one's mobile phone instead of the partner and accordingly transferred the items asking for participants' trust in their phone.</p>	<p>I trust my mobile. I feel attached to my mobile.</p>
<p>Stress caused by your mobile phone (Carolus & Strobl, in prep.) Index of the level of stress caused by your mobile phone, e.g. by lots of unread messages or by read messages when the sender can see that the message is still not answered although read.</p>	<p>My mobile stresses me out.</p>
<p>Coping - Handling stress with your mobile phone (based on: Satow, 2012) Index of dealing and managing stressful situations (= coping) with your mobile phone. The items ask for using the phone as a tool for coping by either actively managing stress, giving social support or creating a distraction from stressful situations.</p>	<p>My mobile helps me to cope with stress.</p>
<p>Inclusion of mobile in the self (based on: Aron, Aron & Smollan, 1996) Adaptation of the "Inclusion of Other in Self (IOS) Scale" originally assessing closeness in relationships. Typical for close relationship: the self and other begin to overlap by including aspects of the other in the self. We transferred this idea to the relationship with smartphones and replaced human beings we might feel close to with mobile phones. As a result, participants were asked to select the picture that best describes their relationship with their mobile phone.</p>	
<p>Smartphone/ Media Usage Duration and experience of participants' smartphone usage.</p>	

Waiting Session

Participants were welcomed and given a short overview of the study (including obtaining informed consent and implementing ethical guidelines) without disclosing all aspects of the procedure or our expectations in any detail. After the welcome, they sat down in a room resembling a comfortable waiting space. Here they were filmed by a hidden camera to objectively capture any smartphone engagement.



Figure 5: Waiting Session

Participants waited for ten minutes. After five minutes the experimenter entered and asked for the participants' body height (as a distractor) and their smartphone PIN. If they refused or asked for a reason the procedural script specified exactly what to reply: "Studies reveal significant correlations between height and the PIN", "We cannot continue without the information!", "You need to give us the PIN". We documented if, and how easily, the PIN was revealed. After waiting for a total of 10 minutes, the experimenter entered again to guide the participant into the next room claiming that preparation for further tasks had been completed.

Results: have we forgotten how to wait? Or is waiting perhaps unbearable?

#needtotouch

73 % of all participants used their smartphone during the waiting session

#waitingunlearned

It takes only an average of 44 seconds of waiting before participants touch their smartphones for the first time. **Men are faster** than women, touching their phone after 21 seconds, compared to 57 seconds.

Both men and women **overestimate the period** of time that passed before they touched their phone. Males estimated that they waited almost 3 minutes, females estimated at more than 2 minutes.

During the 10 minute waiting session, the smartphone was used for **almost 5 minutes** ($M = 4.63$), with no considerable difference between men and women.

#falsegenerosity

93% of all participants who have a PIN code for their smartphone gave this data away, the majority without questioning why. Only three participants refused to give away their PIN code and only five did not have a code at all.

Survey results

Oxford Happiness: “if you’re happy and you know it...”

All participants were similarly happy (on average 5 on a 7-point scale): **no significant differences** were found

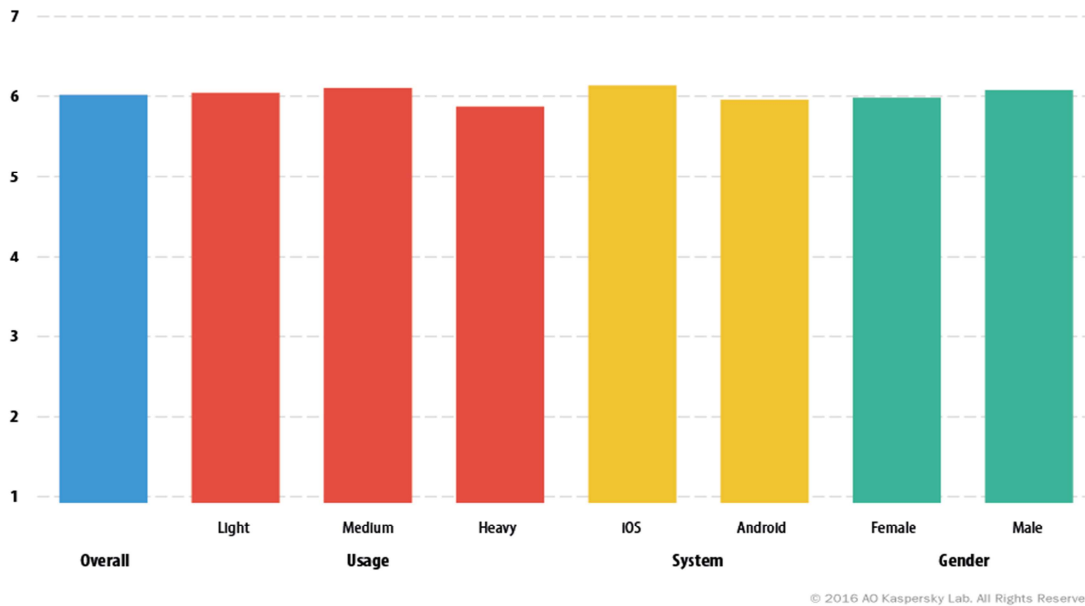
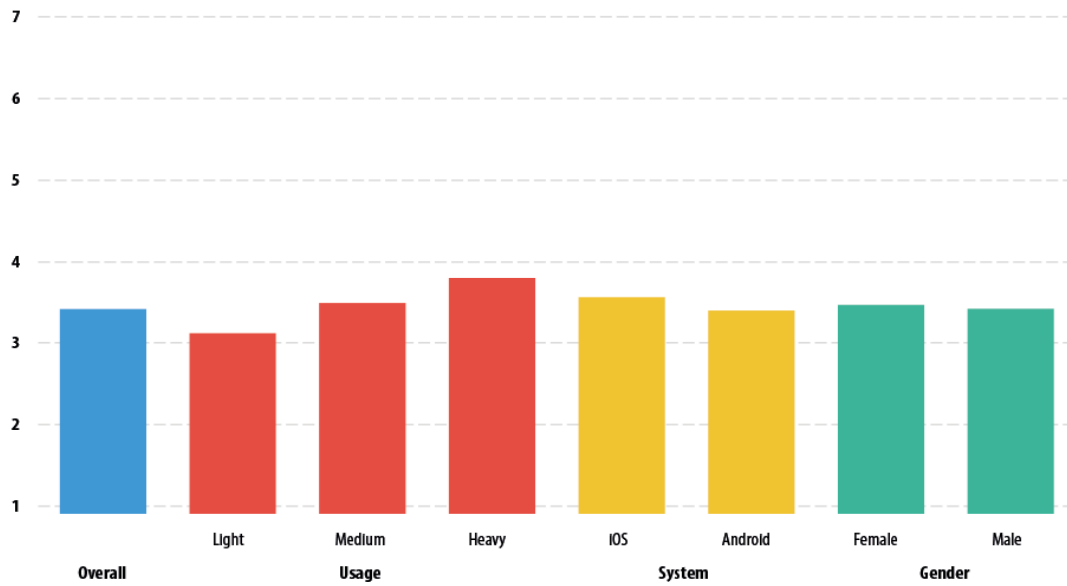


Figure 6: Mean values of the Oxford Happiness Scale by different groups

Considering the Oxford Happiness Scale groups (usage, operating system, and gender) do not differ significantly. This implies that neither the gender of participants, nor their amount of smartphone usage nor the type of operating system on their smartphones, affects the general happiness participants experience.

Fear of Missing Out: “are they having fun without me?!”

Fear of missing out is positively linked to the amount of time spent with a smartphone: participants using their smartphone more intensely are **more afraid of missing something** while not using their phone.



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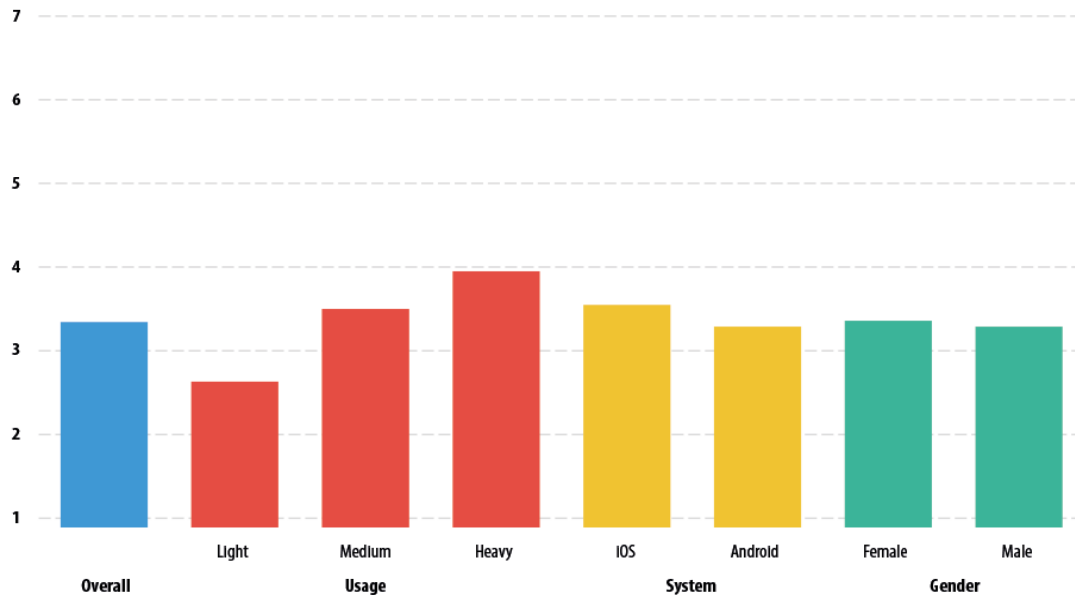
Figure 7: Mean values of Fear of Missing out (FOMO) by different groups

From a scientific point of view: on average participants score 3.43 ($SD = 1.09$) on a 7-point scale. Regarding their fear of missing something while not at the phone we only find mostly minimal and therefore negligible differences between groups, with one exception. The more participants use their phone the more they are afraid of missing out on things ($p < .001$, $F(2) = 26.67$).

At least two conclusions seem plausible here: (1) people use their phone more intensively because they are afraid of missing something important or (2) people become afraid as a result of their intense phone usage.

Involvement with your mobile phone: “who needs a pet? I’ve got my smartphone!”

Heavy usage is associated with a higher smartphone involvement, and iOS users are slightly more involved than Android users



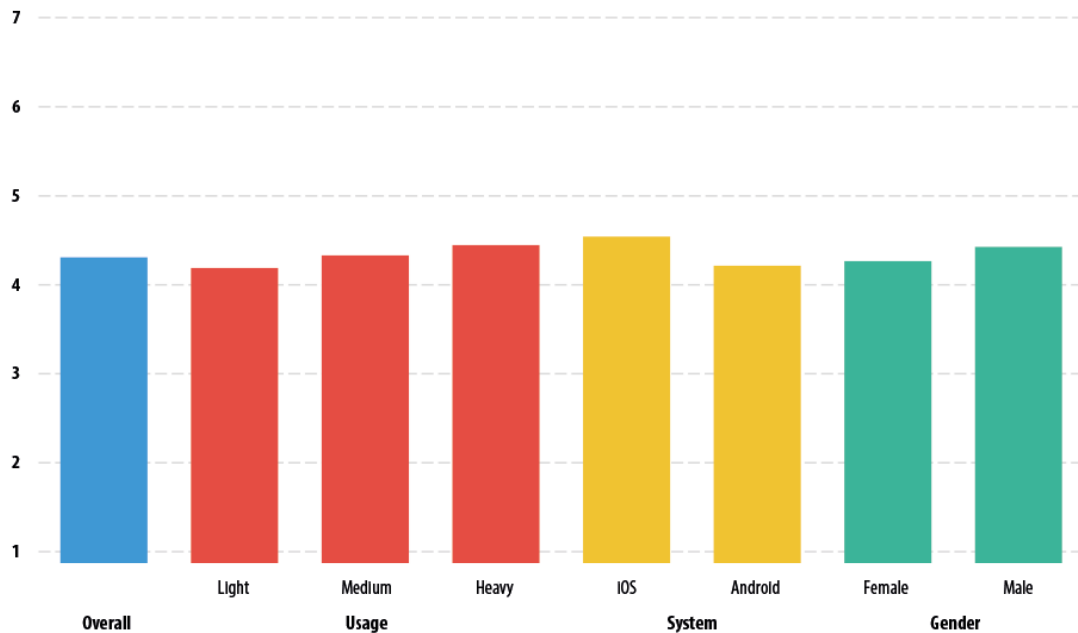
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Figure 8: Mean values of Involvement in one's smartphone by different groups

Scientifically speaking, smartphone usage is positively correlated with a perceived involvement in our digital companion. Accordingly, heavy users report the highest involvement with their phone ($M = 3.96$, $SD = 1.18$), followed by medium users ($M = 3.5$, $SD = 1.15$) and finally light users ($M = 2.63$, $SD = 1.08$) resulting in a significant one-way ANOVA ($p < .001$, $F(2) = 101.72$). Furthermore, a significant mean comparison ($t(1093) = -3.27$, $p = .001$) shows that participants owning an Apple phone (iOS) are more involved with it ($M = 3.55$, $SD = 1.15$) than owners of an Android phone ($M = 3.39$, $SD = 1.06$).

Trust in your mobile phone: “you would never betray me, right?”

Men, iOS users and heavy users trust their smartphone the most. However, we have to be careful: Although these effects are statistically relevant they are rather negligible as the differences are quite small.



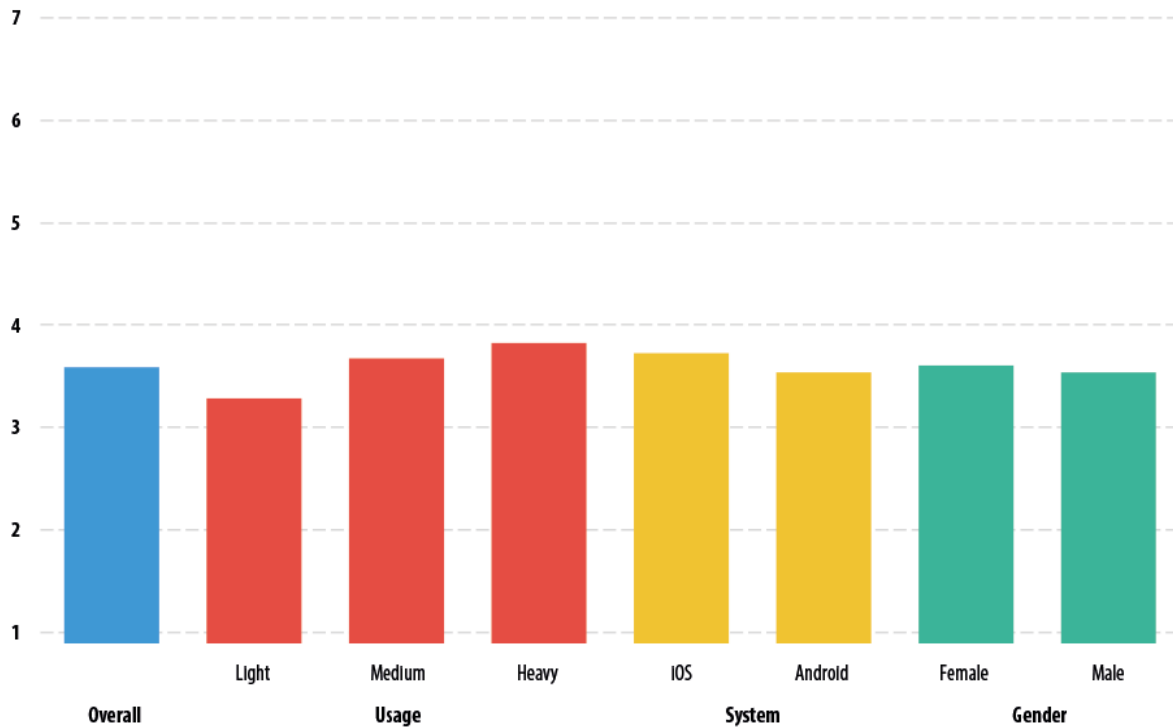
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Figure 9: Mean values of Trust in one's smartphone by different groups

Considering that participants were asked about trust in their phone, thus applying feelings to an electronic device, it is remarkable that the average score is 4.31 ($SD = .86$) on the 7-point scale. Although very small, all group differences in figure 9 are significant: (1) men trust their smartphone slightly more than women, (2) Apple users more than Android, (3) heavy users more than medium, and medium more than light users. Although these differences are statistically significant they are too small to be regarded as substantially relevant effects.

Stress caused by your mobile phone: “now I really need to focus - Oh look, a message!”

The level of stress caused by our smartphone depends on **how much we actually use it**. The more you use your phone the more stressed you are by it.



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Figure 10: Mean values of perceived stress by different groups

From a scientific point of view: on average people experience a medium amount of stress because of their phone (3.60 on a 7-point scale). In terms of group differences only the amount of time spent with your phone is associated with stress as indicated by a significant one-way anova ($F(2) = 19.08, p < .001$).

Coping - Handling stress with your mobile: “keep calm and play some Candy Crush!”

The amount of time spent with our phone is positively correlated with how much we utilise it to release stress

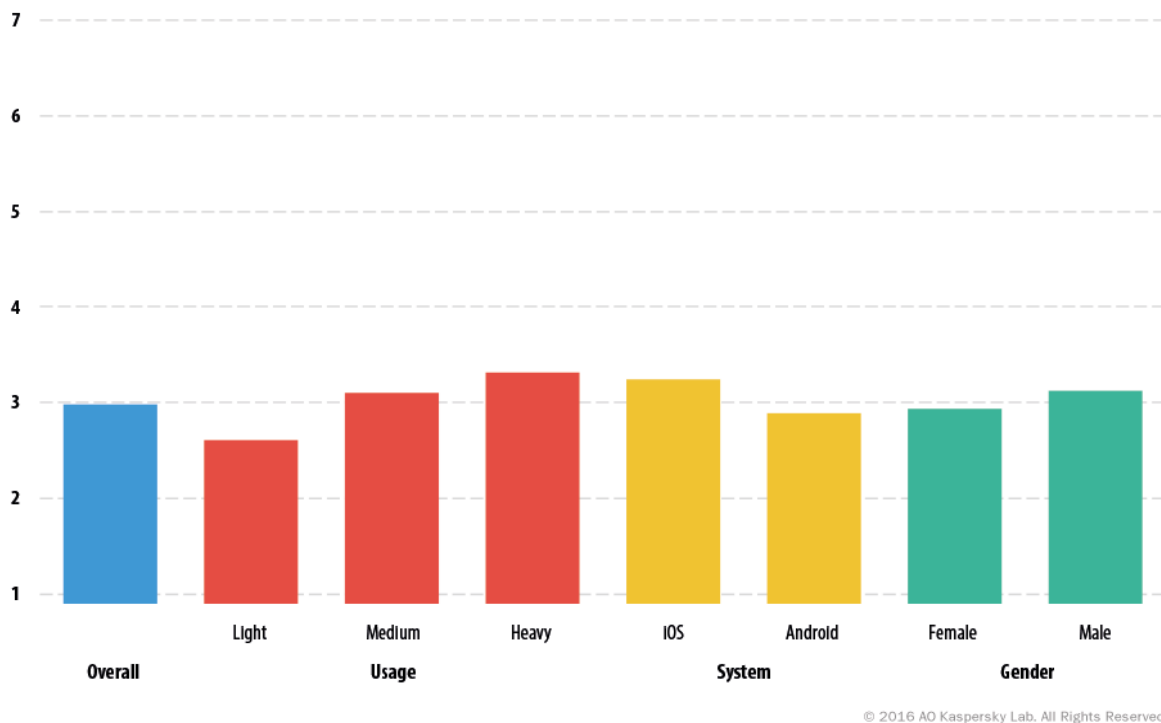
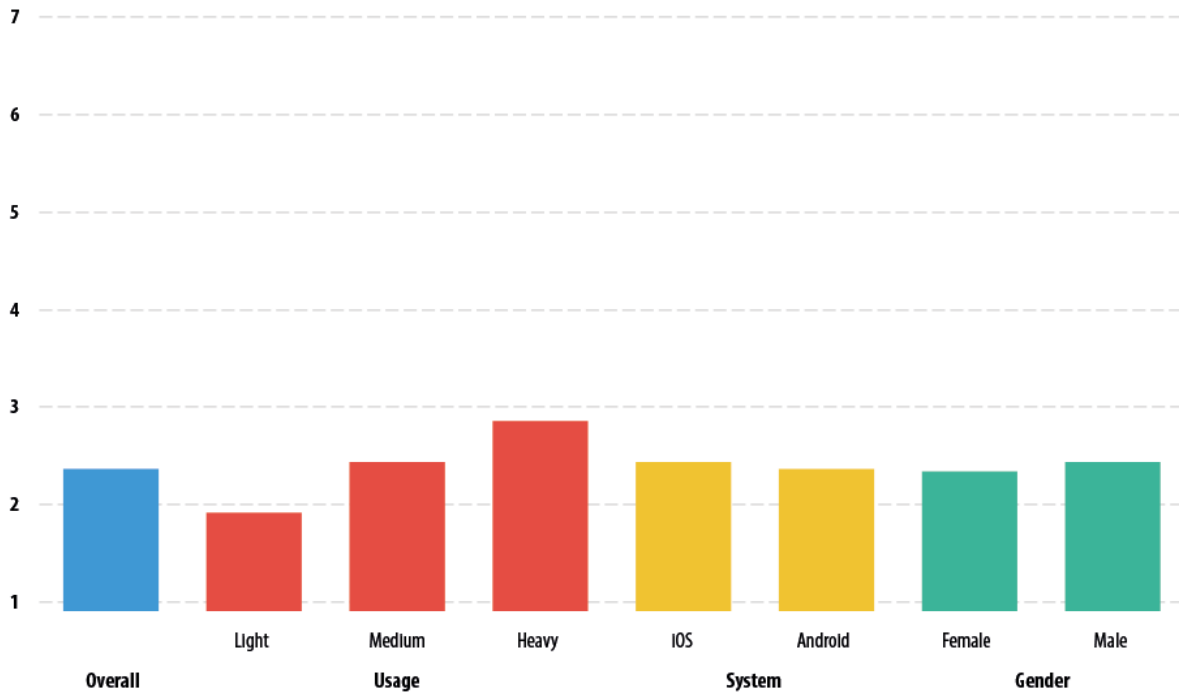


Figure 11: Mean values of the Coping scale by different groups

Scientifically speaking, on average smartphones are used rather less intensively for coping with stress (2.95 on a 7-point scale). In terms of group differences we find heavy users scoring significantly higher on the coping scale which means that heavy users use their phone more for coping with stress. This is further demonstrated by a significant one-way anova ($F(2) = 19.08, p < .001$).

Inclusion of mobile in the self: “it’s like we are the same person!”

People spending more time with their smartphone perceive their phone as a more integral part of themselves, typically indicating more closeness and intensity in human-human relationships.



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Figure 12: Mean values of inclusion of mobile in the self by different groups

From a scientific point of view: To interpret these results we need to take into account the fact that this instrument is typically used to assess our closeness to one’s romantic partner or significant others.

Respondents were asked to report on “their current relationship with their smartphone” by choosing differently overlapping circles representing themselves and their phone. The low overall scores on this scale are therefore not surprising ($M = 2.39$, $SD = 1.23$). Nevertheless, a significant one-way anova implies that the relevance of the smartphone to its owner’s sense of self rises with increasing usage ($F(2) = 50.57$, $p < .001$; light users: $M = 1.93$, $SD = .99$; medium users: $M = 2.46$, $SD = 1.14$; heavy users: $M = 2.86$, $SD = 1.44$).

Joining the dots: cross-connections among variables

Beyond the results for particular instruments and concepts presented so far, we must also take a brief look at cross-connections of the constructs. A selection of the most important connections is presented below. The statistical indicator used is the bivariate correlation (r).

→ Stress caused by one's smartphone is positively correlated with coping ($r = .51$)

Our data reveals significant positive correlations between the level of stress caused by one's smartphone on the one hand, and the level of using the smartphone as a way of coping with stress on the other hand. As a correlation does not imply a particular causal relationship we cannot determine what came first: stress or coping. However, we could cautiously assume that people use their phone to cope with stress, which they would not have without their phone.

→ There is a significant correlation between stress caused by one's smartphone and fear of missing out ($r = .46$)

Similarly, we find a significant positive correlation between stress caused by one's smartphone and fear of missing out: the more stress the higher the fear of missing out.

There is a conceivable explanation here: The more afraid you are of missing something important when you are not using your smartphone, the more stressed you will be by your smartphone.

→ There is a significant correlation between coping with stress through your phone and involvement in one's mobile phone ($r = .50$)

Here we would assume that using your phone for coping with stress could lead to an increased involvement with your phone. The more your phone helps you to handle life, the more relevant the phone becomes and as a result the more involved you are with the phone.

→ Involvement in one's mobile phone is positively correlated with fear of missing out ($r = .52$)

Again, we can only speculate on the direction of the correlation between the fear of missing events and involvement with your phone. Our speculation here is that: more fear of missing out might lead to an increased involvement with your phone, because your phone is your primary connection to the world. However, as with all correlations, we cannot gain more insight into any underlying causal relationship.