1. Project title

Does smartphone use make adolescents depressed? A data scientific approach to examine the psychological correlates of smartphone usage.

2. Coordinators

This project is the result of a collaboration between three Tilburg professors from three different schools:

- Dr. Mariek Vanden Abeele is an Assistant Professor currently in the department of Cognition and Communication (DCC, TSHD)
- Dr. Andrew Hendrickson is an Assistant Professor currently in the department of Cognitive Science and Artificial Intelligence (DCA, TSHD)
- Dr. Loes Keijsers is associate professor in developmental psychology in the department of Psychology (TSB)

3. Project Summary

Are smartphones destroying a generation? The Atlantic asked this question in a fiercely debated article that connected the rising rate of depression and anxiety among adolescents with increased smartphone use. It seems that the unprecedented rapid adoption of smartphones among adolescents has resulted in a knowledge gap where we do not fully understand the consequences of smartphone usage for adolescent mental health and wellbeing. Understanding these consequences is a crucial prerequisite to the development of optimal interventions to protect adolescents' health in an increasingly digital society. Unraveling the complex relationship between smartphone use and adolescent health, however, demands a strong collaboration between scientists of different disciplines; including communication sciences, data science, and psychology. This project establishes such a multi-disciplinary collaboration between top-scientists in their respective disciplines.

Extant research on the relationship between smartphone use and adolescent health and wellbeing provides intriguing insights. Half a year ago, a book (Twenge, 2017) and article (Twenge, Joiner, Rogers, & Martin, 2017) were published in which the smartphone was identified as the main culprit for increased levels of anxiety, depression, loneliness and suicides in generation *iGen*. In the slipstream of the release of these publications, concerned Apple shareholders sent a letter to their board of directors, requesting them to urgently address children's screen addiction (see https://thinkdifferentlyaboutkids.com/). The shareholders' concerns resonate with a substantial body of scholarly work that shows an urgent need to prevent and tackle adolescents' screen addiction. Indeed: In the Netherlands, 10% of adolescents are addicted to social media (van den Eijnden, Lemmens, & Valkenburg, 2016), 9% of video gamers are addicted to gaming (Lemmens, Valkenburg, & Peter, 2009), and both populations display higher rates of anxiety and depression than their peers (Andreassen et al., 2016).

However, there is also a concern for an unwarranted moral panic about adolescent smartphone use (Livingstone, 2018), and a general pushback against the overuse of the 'media addiction'-label in the broader academic field (Van Rooij et al., 2018). A substantial body of research shows positive associations between smartphone use and adolescent health and wellbeing. Indeed, adolescents reap ample benefits from smartphone use in their daily lives, especially in the management of their social relationships (Vanden Abeele, Schouten, &

Antheunis, 2017; Vanden Abeele, 2016), which increases their wellbeing (Peter, Valkenburg, & Schouten, 2005).

The ongoing debate in the public domain illustrates the open questions at stake, to which scientists, at this moment, cannot provide a solid answer. Current research endeavors are plagued by both conceptual and methodological shortcomings that hinder making nuanced claims about the link between smartphone use and adolescent wellbeing. Two crucial shortcomings are the assumption that screen addiction and the relationship with health outcomes manifest themselves uniformly across adolescents, and the assumption that self-report measures administered to small samples can reliably and validly capture them. These shortcomings show that there is an urgent need for innovative research that sheds new light on the relationship between smartphone use and adolescent health and wellbeing. This project identifies the risks of media use in such an innovative way, thereby capitalizing on the unique strengths of key experts in the different disciplines united at TiU.

A key assumption of this project is that screen addiction and its associated health outcomes manifest themselves in unique ways in specific adolescents, depending on the unique environmental influences they are exposed to. The latter approach aligns with a paradigm shift ongoing in the social sciences in which person-specificity is at the heart of research (Keijsers & van Roekel, in press; Cramer et al). Data science acknowledges that critical predictive features of behaviors are complex and dynamic. This is particularly true of an individual's media behavior. It is inherently a time-dependent signal with patterns of behavior characterized by bursts of activity in short durations as well as cycles that repeat daily, weekly, and over longer durations.

This project is innovative in that it combines a study in which we assess smartphone use via data logging, thus obtaining a unique insight into the patterns in which smartphone use may establish itself in different adolescents. By connecting this information to indicators of health and wellbeing we aim to find associations between specific patterns of smartphone use on health and wellbeing indicators.

5. Research Trainee Profile

We are looking for two research trainees:

1. The first research trainee has an outspoken interest in the main research question (is there a relationship between smartphone use and indicators of health and wellbeing). This student will play an important role in the shaping the literature review, and will contribute considerably to the data collection for this project. We expect this research trainee to have some experience with quantitative methodology and research designs, but to be mostly willing to work on theory building as well as contribute to the practicalities of the data collection (participant recruitment, data management, etcetera). We envision this research trainee to have a background in the track BDM, CD or NMD.
2. The second research trainee has an outspoken interest in statistical modeling. This student will work on the detection of patterns in mobile phone usage and how we can predict outcomes based on these patterns. He or she will also assist in the practicalities of collecting data for the study. We expect this research trainee to have some experience with programming and preferably experience or a strong interest in machine learning and statistical modeling. This research trainee is preferably a student in the track DSBG or CSAI.

6. How to apply for this research traineeship?

Students from both the Bachelor (2nd or 3rd year) and Master program are eligible to apply. Applications should be sent to Dr. Mariek Vanden Abeele (m.m.p.vandenabeele@tilburguniversity.edu). The deadline for applying is **XXXXXXXX**. Applicants might be interviewed as part of the application process in **XXXX**.

In their application students should include:

1. A personal motivation (max. 500 words).
   In the motivation, specify which trainee role you are applying for, why you are interested in participating in this traineeship, and describe any relevant experience or courses you have taken.
2. A brief resume
   For the trainees interested in the 'data science' traineeship: please include a brief description of your experience with programming (courses or independent projects) and a sample of code you wrote and are comfortable explaining in an interview.
3. Your tentative schedule
   For the research traineeship, we expect you to work 6 hours/week on the project. This can be either 6 hours on 1 weekday or two 3 hours spread over two sessions. If you already know your course schedule, please note when you would be free and available to work on the traineeship in the upcoming semester in the motivation letter or resume.