



# There's Probably an App For This: How We Identified a Relationship Between Cell Phone Use, Academic Performance, Anxiety and Happiness

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We like to say that the idea for this research was hatched over the grill at a backyard barbeque. And that's the truth. It was. We were discussing the widespread use of cell phones across our college campus. We had observed students using phones in every conceivable setting and circumstance - the classroom, the library, the recreation center, on sidewalks, on benches, in cars, in the grass, and under the trees. Of course, we have all seen this. We've probably seen it in ourselves. It is nothing novel anymore. But at the heart of our conversation was the idea that more often than not, the cell phone users were sitting or standing still. We also saw this at the barbeque with our own children if someone tossed them an iPhone. That led us to this hypothesis: despite its inherent mobility, cell phone use disrupts physical activity, encourages sedentary behavior and consequently reduces cardiorespiratory fitness. We developed a study to test this and the findings supported the hypothesized relationships (Lepp et al. 2013). As part of that study, we interviewed 49 college students about their cell phone use. We asked a variety of questions related to the hypothesis, but we also asked students to describe their cell phone use and how cell phone use makes them feel. Of course, many students described feeling happy or connected when using the phone; but to our surprise, an equal number of students described feeling anxious, stressed, annoyed, irritated and regretful. As we looked more closely at the data, it appeared that the students who reported these negative feelings were the students who used the phone the most. Students also reported being distracted by the phone when studying and using the phone in class. This did not surprise us. However, we were intrigued when once again we noticed that these behaviors appeared more frequently among students with the greatest cell phone use. Considering this new information, we hypothesized that cell phone use would be negatively associated with academic performance, positively associated with anxiety, and that together these relationships would link increased cell phone use with decreased happiness (Lepp, Barkley, and Karpinski 2014). Testing this hypothesis led to the article we will discuss below. Thus, it too can be traced, albeit circuitously, to that backyard barbeque.

Since very little research has examined these issues, we felt that assessing the hypothesized relationships would make a nice contribution to the extant cell phone literature. We created a survey with the intent of administering it to 500 undergraduate students. The survey included a validated measure of anxiety, a validated measure of happiness (subjective well-being), a self-report measure of

cell phone use which we had previously developed and published, and lastly a consent form which would give us permission to access participants' official academic records. This was necessary as participants' actual, cumulative grade point average (GPA) would be our measure of academic performance. After gaining approval from the university's Internal Review Board (IRB) as well as the university Registrar, we were ready to collect data. This was the tricky part. IRB approval required that we carefully explain to each participant how we would access their academic records and how we would keep that information confidential and anonymous. To do this, we needed help from faculty with no direct stake in the project. First, we identified a mix of large classes across campus likely to yield a final sample representative of the larger student body - that is to say, a sample with a wide array of majors and evenly distributed by class standing. Second, we contacted the professors for each class, explained the project and requested thirty minutes of their class time in order to administer the survey. This was a bit awkward since we had nothing to immediately offer in return, only a promise to repay the favor in the future. As it turned out, each of the professors we contacted was interested in the study and freely gave their class time. For this we are very thankful - there is a generous and supportive faculty here at Kent State University and we are privileged to be a part of it.

What happened next was relatively easy in comparison to some of our other projects. After a dedicated graduate assistant entered the data into a spreadsheet, a path analysis revealed that each of the hypothesized relationships were significant and in the hypothesized direction. Furthermore, all of the fit indices suggested a very good model. Thus, there was no need to develop and test alternatives. The central finding was this: cell phone use was negatively related to GPA and positively related to anxiety. Following this, GPA was positively related to happiness while anxiety was negatively related to happiness. Thus, for the population studied, high frequency cell phone users tended to have lower GPA, higher anxiety, and diminished happiness relative to their peers who used the cell phone less often. We carefully prepared a manuscript highlighting previous research and presenting our own findings. We submitted it to the journal *Computers in Human Behavior*. This was our first choice because much of the research we reviewed had been published there, the journal is highly respected, and it has a well-developed online presence. The journal's reviewers and editors provided positive feedback and helpful comments for fine tuning the manuscript. It was accepted with only minor revisions and soon after published online.

Along with the online publication, Kent State University issued a press release highlighting our findings. Within an hour of the press release our phones began ringing. First it was local media and by day's end we had a call from TIME magazine. TIME placed a brief article online within 24 hours. In England, the Daily Mail and Guardian soon followed. Then the tweets began. In all, the article stayed in the news for nearly a month and made its way to TV and radio as well. We had a sense this would be of interest to the public but the magnitude of coverage was surprising. To explain this media interest we need only consider the ubiquity of the cell phone. The majority of adults and an increasing number of adolescents and children carry one. Furthermore, with their expanding functionality and Internet connectedness, cell phones have transcended their utilitarian purpose of two-way communication and have entered the realm of pop culture. Cell phones are now marketed as lifestyle enhancers and status symbols. Nevertheless, there is a sense among some that we have become too dependent on the devices (Gibson 2011). Or a sense that after a point, cell phone use may no longer be beneficial. There are now reports of people texting in their sleep (Roberts 2013), experiencing nomophobia (Kung 2012), using the phone as a source of personal identity (Foley, Holzman, and Wearing 2007), and experiencing the phone ringing when it is not (Hu 2013). Add to this our research linking cell phone use with decreased academic performance, increased anxiety and reduced happiness and it raised a red flag. To be clear, our research identifies relationships, not causality. The media was quite vigilant about highlighting this distinction. Even so, it is apparent that the findings hit a nerve and perhaps inspired a brief and critical reflection on our society's cell phone infatuation - a reflection which no doubt was soon interrupted by a text, tweet, Facebook update, or impulse to conquer the next level of Candy Crush Saga.

The public was extremely receptive to this research. It does make for intriguing discussion and debate. Yet there were negative comments from the public as well. These voices were accusing us of spending government money to research the obvious. In response: this study was not funded, we never

requested funding, and it cost us nothing other than our own time and effort. That said, if you are reading this and happen to be a reviewer for the National Institute of Health - we have some great ideas for expanding this research but they will require your financial assistance.

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