

Should We Ban Smartphones from the Workplace to Increase Productivity? Evidence from a Natural Field Experiment

Adrian Chadi

IAAEU, University of Trier
chadi@iaaeu.de

Mario Mechtel

Leuphana University of Lüneburg
mario.mechtel@leuphana.de

Vanessa Mertins

University of Vechta
vanessa.mertins@uni-vechta.de

Smartphones have become increasingly prevalent over the last years and, by providing permanent internet access, have created notable changes in the lives of their users. Recent surveys reveal that HR managers see smartphones as a severe time thief at the workplace. Employees seem to use their smartphones during the working time, which led to a significant share of employers implementing smartphone/cellphone bans. These bans are implemented in order to weaken the negative productivity effects of being distracted by using one's smartphone. However, there is to the best of our knowledge no study that investigates the effect of prohibiting smartphone use at the workplace on employees' motivation and effort.

On the one hand, it is important to provide such evidence from an HR perspective. On the other hand, it is also interesting from an economic point of view given the growing literature on control, monitoring, and trust as signals which effect individual behavior (See, for example, Falk and Kosfeld (2006, AER), Ellingsen and Johannesson (2008, AER), Nagin et al. (2002, AER), Dickinson and Villeval (2008, GEB), Sliwka (2007, AER), and von Siemens (2013, JEBO)). First, one might expect a positive effect of a smartphone ban on employees' productivity, assuming that they are less distracted from their work. However, such a ban could be interpreted as a signal of distrust, lowering employees' motivation and, hence, effort. From a theoretical perspective, it remains unclear whether the expected positive productivity effect of the ban is able to compensate the negative effect of potentially sending a distrust signal.

We conduct a natural field experiment to test for the effect of a cellphone ban on individual work output. Our setup allows us to disentangle the basic effect of the ban from the potential distrust effect. To implement our different treatments, we utilized a study conducted at the University of Trier, Germany, in which casual employees helped conduct a survey. These individuals were employed for a one-time job that lasted 4 hours. Within this time, they conducted telephone interviews on the TV usage of the German population ("*Trierer Fernsehstudie*"). Implementing our field experiment in such a setting was very natural for several reasons: Similar interviewer jobs are typically carried out by pensioners and students. Given that the "*Trierer Fernsehstudie*" is carried out by a team of researchers of the University of Trier, it was very plausible to hire only students. Although these individuals are not yet in the labor market, they soon will be. They belong to what is often called "generation smartphone" and are permanently online and connected through a myriad of social networking apps such as WhatsApp etc.

In February 2015, the research team of the "*Trierer Fernsehstudie*" announced one-time job opportunities for students. Several hundred individuals applied for the job via an online form. Out of this pool, more than a hundred students agreed to work on specific dates, to which we invited the applicants. Each subject arrived at the headquarter of the "*Trierer Fernsehstudie*". A research assistant (which was the same person for all subjects) showed the subject her office and gave an introduction of around 10 minutes. Subjects had to dial numbers from a large list. After 3 hours and 35 minutes, the research assistant walked in and handed out a short feedback questionnaire. After 5 additional minutes, the subject received her expense allowance of 30 Euro.

In this work environment, we experimentally varied whether cellphone use was prohibited or not. Overall, we used a very natural way of implementing the treatment that proved to be very effective but was specifically designed to be unsuspecting. In particular, no verbal treatment was needed, which helped us to avoid experimenter effects. Our setup consists of three conditions. In the *“Smartphone Ban Treatment”* (B), the use of cellphones was prohibited. In the *“Smartphone Ban & Trust Signal Treatment”* (B&T), the use of cellphones was prohibited and subjects received an additional trust signal to neutralize the potential distrust signal of the ban. The third condition without ban and trust signal acts as our benchmark and is referred to as *“Control Treatment”* (C).

Both the cellphone ban and the trust signal were implemented via a sign on the wall. Subjects were randomly assigned to treatments (between-subjects design), based on a stratification strategy that guaranteed (nearly) the same proportions of female/male subjects in the morning/afternoon per experimental condition. Assuming that cellphone use during the working time reduces an employee's productivity, we expect a smaller output level in the control condition than in the two treatments (B and B&T). If the ban was perceived as a signal of distrust, this might, however, counteract the positive effect of the ban on individual output. In this case, we expect that individual output is higher in the B&T treatment than in the B treatment. The difference between these two would then represent (a conservative estimate of) the distrust effect.

Our employees had to call numbers from large lists, and we therefore use the quantity of dialed phone numbers as our measure for individual work output. Average individual output was significantly higher in both ban treatments than in the control condition. However, we do not find a difference in individual output between the two ban treatments. Besides statistical significance, the effects are also economically significant: The cellphone ban increased individual output by more than 10 percent, irrespective of the existence of an additional trust signal implemented to neutralize the (potential) negative trust signal induced by the ban.

Given that we know the exact duration of each phone call (irrespective of whether it yielded a successfully completed interview, a refusal of participation, having called an answering machine etc.), we are furthermore able to account for the net time in which each employee was able to dial numbers (i.e. the time that she did not need to talk to individuals on the phone). Given that some interviewers might have conducted more interviews by chance, which should c.p. reduce their possibility to dial more numbers, our second output measure focuses on the number of dialed numbers per minute of *“net dialing time”*.

Our conclusions with respect to the overall effects of the ban based on the raw output measure are supported by this additional measure: Individual output increased by more than 10 percent when the use of cellphones is prohibited. Although the differences between the B and B&T treatments are not statistically significant, it appears that there is a weak negative distrust effect induced by the ban. Our results hold once we run OLS regressions using an employee's number of (1) dialed numbers and (2) numbers per minute of *“net dialing time”* as dependent variables, controlling for factors such as age, gender, day fixed effects, etc.

The data from a detailed survey conducted some weeks after the experiment give us the possibility to analyze different indicators for employees' trust levels, preferences, emotions, and, most notably, cellphone use. The more detailed description of our results will be complemented by the data from this survey, which, amongst other things, suggest that actual cellphone use was indeed smaller in the two treatments.