Directing Smartphone Use Through the Self-Nudge App *one sec*

Keywords: app use, self-nudging, online behavior, field experiment, one sec

Extended Abstract

While smartphones enrich people's lives and prove useful in several domains (e.g., Bentley et al., 2020), the literature also reports severe risks to their excessive use (e.g., Kula et al., 2020). Notably, it seems that such negative effects not only depend on the amount but also the type of digital consumption. While automatic consumption shows negative effects on well-being, deliberately consuming has mild positive associations (e.g., Sela et al., 2022). Research should provide users with tools to counteract most apps' purpose to attract automatic user attention. Ideally, research should offer users interventions that can be implemented by themselves and that avoid paternalistic frameworks.

External smartphone apps provide an optimal structure for self-responsible interventions on digital media consumption. They can be applied to diverse scenarios and environments and provide users with a control tool that can be installed and used autonomously and independent from the problematic consumption environment. External apps support users to become their own choice architects, a concept called self-nudging (Reijula & Hertwig 2022).

Self-nudge app *one sec.* One app that has the potential to serve as such a self-nudge tool is *one sec*. The intervention effect of one sec is based on three components combined in the app. First, when users open an app to consume it, one sec imposes a ten-second delay (accompanied by a moving screen effect) before users can continue to the target app. This feature imposes *friction* on the user's consumption habits to steer behavior in different directions (e.g., Fazio, 2020). Second, when attempting to open an app, users are presented with a short message pointing at what they are about to do. This feature activates users' *deliberate* thinking (e.g., Kattsaros et al., 2022). Lastly, one sec provides the user with the explicit *option to dismiss* opening the target app. This convenience nudge makes it easier for users' to not consume by just one touch, thereby changing the choice process.

We assess one sec's effectiveness in the field (Grüning et al., 2023). We answer four questions. First, does one sec reduce participants' digital consumption (RQ1a)? If so, how durable is this reduction effect (RQ1b)? Second, does the app also increase users' subjective happiness with their consumption (RQ2)? Third, does the app increase people's deliberate digital consumption (RQ3)?

Methods. We recruited 280 participants who used one sec throughout the whole study duration (i.e., six weeks). All participants had just installed the app on their smartphones. We collected two different types of data: digital behavioral data in the form of participants' activities with one sec collected continuously throughout the six weeks and self-report data collected in the two administered surveys before and after the six intervention weeks.

Results. Addressing RQ1, when a user attempted to consume on an app, one sec nudged them to not do it in 36% of the cases across the six weeks. This effect was largest in the first week, namely, at 43%, and decreased over week two (36%), remaining rather stable (32% - 34%) until after week six. In addition and addressing RQ3, users also 37% less frequently attempted to consume on an app in the first place. That is, the overall app opening attempts decreased with each week, being highest in the first week (166 opening attempts on average) and lowest in the last week (105 attempts). Both effects added up to users consuming on apps 57% less often after the six intervention weeks than before (see Figure 1).

Addressing RQ2, users indicated having, on average, spent 77 minutes less consuming on apps after having used one sec for six weeks, $p < .001$, $r_{rb} = -.56$. Further, respondents reported their digital consumption became less problematic, $\Delta M = 0.70$, $p < .001$, $r_{rb} = .70$, and they indicated being substantially happier with their consumption, $\Delta M = 1.24$, $p < .001$, $r_{rb} = .81$. Lastly, 69% of the users indicated that one sec partly or mostly solved their consumption problems and 62% reported to have met their consumption goals with the app.

In conclusion, one sec's self-nudging intervention effect is diverse, substantially decreasing automatic consumption while supporting deliberate consumption, and transforming into positive impact on different areas of users' subjective well-being. Mobile apps are a promising alternative and complementary method to interventions directly installed within problematic digital environments like Twitter. Both intervention approaches should be combined to help users more effectively navigating their digital consumption.

References

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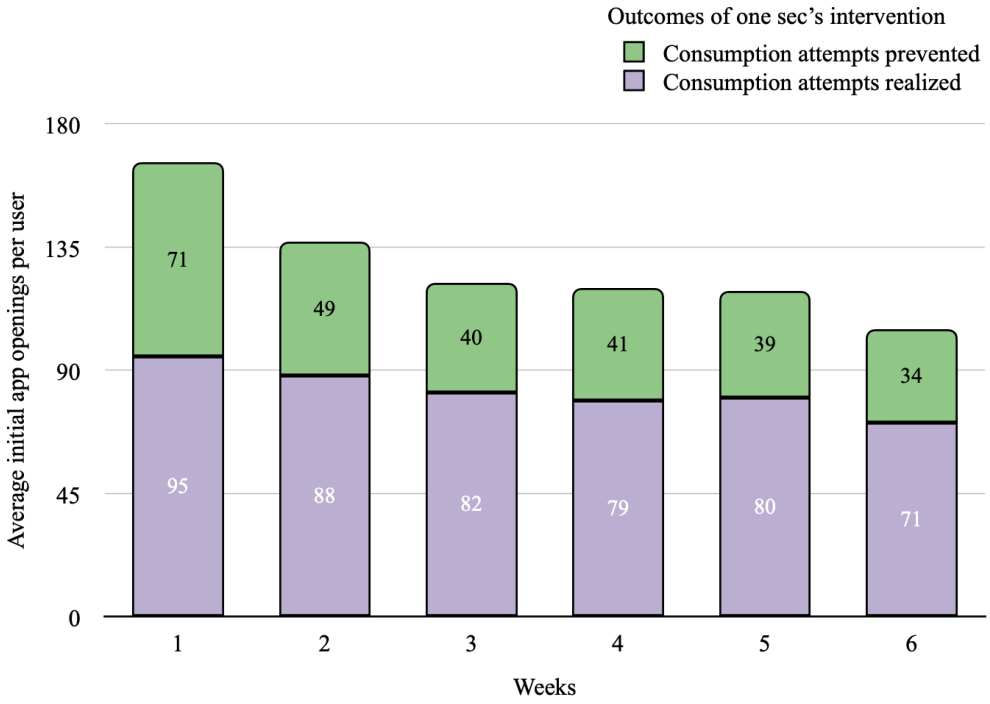

Figure 1. Overall effect of *one sec* on app openings across 6 weeks. Green indicates the instances in which users intended to open an app but closed it due to the *one sec* intervention. Purple indicates the instances in which users continued opening the app despite *one sec*'s interference.