Jun 10, 2021

# How bad is the mere presence of a phone? A replication of Przybylski and Weinstein (2013) and an extension to creativity, PLoS ONE 16(6), 2021

Claire Linares[1], Anne-Laure Sellier[1]

[1]HEC Paris

Other Share dx.doi.org/10.17504/protocols.io.bt83nryn

Claire Linares

ABSTRACT

A 2013 article reported two experiments suggesting that the mere presence of a cellphone (vs. a notebook) can impair the relationship quality between strangers. The purpose of the present research is twofold: (1) closely replicate this article's findings, and (2) examine whether there may be an impact of the mere presence of a phone on creativity, whether at a group- or an individual- level. In two experiments ($N$ = 356 participants, 136 groups), we followed the original procedure in the 2013 article. In particular, groups of participants who had never seen each other before the study had a conversation in the mere presence of either a smartphone or a notebook. The participants then carried out creative tasks, in groups (Studies 1 and 2) or alone (Study 1). In both studies, we failed to replicate the original results on relationship quality. We also failed to find any effect of the mere presence of a phone on creativity. We discuss possible reasons which may have caused differences between our results and the original ones. Our main conclusion is an effect of the mere presence of a phone on relationship quality and creativity is at minimum harder to find than what was previously assumed in the literature. More generally, this research contributes to qualify the view that smartphones are harmful.

DOI

dx.doi.org/10.17504/protocols.io.bt83nryn

PROTOCOL CITATION

Claire Linares, Anne-Laure Sellier 2021. How bad is the mere presence of a phone? A replication of Przybylski and Weinstein (2013) and an extension to creativity, PLoS ONE 16(6), 2021. **protocols.io** https://dx.doi.org/10.17504/protocols.io.bt83nryn

MANUSCRIPT CITATION please remember to cite the following publication along with this protocol

Linares C, Sellier A-L (2021) How bad is the mere presence of a phone? A replication of Przybylski and Weinstein (2013) and an extension to creativity. PLoS ONE 16(6): e0251451. https://doi.org/10.1371/journal.pone.0251451



CREATED

Apr 15, 2021

LAST MODIFIED

Jun 10, 2021

PROTOCOL INTEGER ID

49147

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BEFORE STARTING

Our two studies followed the same general procedure with minor changes for Study 2 (indicated in the procedure). First, we followed Przybylski and Weinstein's (2013) Study 1 procedure to replicate their findings on the effect of the mere presence of a smartphone on relationship quality. Then, we extended this procedure by adding a group creativity task (Studies 1-2) and an individual creativity task (Study 1). Following these tasks, participants had to answer a final questionnaire to assess relationship quality and self-reported measures on the creative process. See Figure attached for the major steps of the procedure.

Fig1.tiff

## Lab sessions: Preparation of the study room and manipulation

1 Preparation of the room layout

The study rooms have two tables, one with the smartphone or notebook and the second one for the creativity tasks. Please see the schemas for the layout of the rooms.

Fig2.tiff

**Figure 2. Layout of the study rooms during the conversation and creativity tasks (Studies 1 and 2).** Schematic drawings of a bird's eye view of the study rooms during the conversation for dyads (A) and triads (C), and during the creative tasks for dyads (B) and triads (D). In the rooms, the smartphone or notebook (1) was placed on a paper sleeve (2), next to a clock (3) on the main table. Chairs (4) were placed next to the main table. A second table (5) was added for the creative tasks. Adapted from Przybylski and Weinstein (2013).

2 Preparation of the manipulation (mere presence of a smartphone versus a notebook)

- In the smartphone condition, the smartphone is a nondescript black smartphone with a minimal design and a brand not well-know and not visible. The smartphone's screen is facing up.
- In the notebook condition, the pocket notebook is approximatively the same size and color (black) as the smartphone

Underneath the object is placed a purple paper sleeve.
In both conditions, there is a clock next to the smartphone or notebook.

Please see the pictures attached.

S1_Picture.docx

## Lab sessions: Reception of participants

3 Participants are invited in sessions of four participants to form two dyads or one triad in case of absence, or in sessions of six participants to form two triads.

4 While waiting for the beginning of the session, participants sign a consent form.
At the beginning of the session, we ask participants whether they have ever talked to another member of the session before or while waiting for the study to start.
Based on the responses, we form either one or two groups of participants who have never talked to each other.

5 Before entering the study room, participants leave their personal belonging (including their phones) in a locker room. Each group is settled in its own room.

## Lab sessions: Replication of Przybylski and Weinstein (2013) 10m

6 Groups are randomly assigned either to the smartphone or notebook procedure and settled in the corresponding room.



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7 Once participants are settled, they are asked for their first names and given a participant number to trace their group creation and later on their questionnaire answers.

The experimenter gives the instructions for the relationship formation task from Przybylski and Weinstein (2013). Specifically, he/she asks groups of participants to "discuss an interesting event that occurred to them over the past month" during 10 minutes.

Lab sessions: Group creativity task 15m

8 When the 10 minutes of discussion are over, the experimenter comes back in the study room and adds the second table next to the first one (see the layout in step 1).

Participants are given the instructions for the toy task (Moreau and Dahl 2005).
Each group is asked to design a new toy, as creative as possible, for a child from 5 to 11, using shapes from a given list. See material for the instructions attached. They are given a piece of paper (A3 format), pencils and a rubber, as well as scrap paper.

Participants have 15 minutes to draw the group toy and list five reasons why they think their toy is creative.

S1_Appendix.docx

9 Participants are reminded when there are 5 minutes left.
When the time is up, the experimenter returns in the study room and asks each group to write a small description about the toy and how it works on the sheet of paper with the toy drawing.

Lab sessions: Individual creativity task (only in Study 1) 10m

10 Participants are given an individual convergent creative task, the Remote Associates Test (RAT, Mednick 1962).
They have 10 minutes to solve up to 10 RATs individually.
They are asked not to talk to each other.

Please see material attached (translated in English).

S2_Appendix.docx

Lab sessions: Final questionnaire

11 Participants leave the study room and are guided to individual cubicles to answer a questionnaire on a computer.
The questionnaire includes three series of measures. First, self-assessments on the creativity of the group toys and satisfaction, and creative process measures. Then a second series of measures on the initial conversation (including measures from Przybylski and Weinstein 2013). Finally, questions on phone ownership and usage, and demographics and mood measures.

See complete questionnaires attached.

S3_Appendix.docx

S4_Appendix.docx

12 Before leaving the lab, participants are probed for suspicions. Participants are then debriefed, compensated and thanked.
Participants are compensated 12€ for the whole session including the individual creativity task and 10€ for the study without the individual creativity task.



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## Evaluation of group toys creativity

13 Following the lab sessions, twelve to thirteen peer judges are invited to independently rate each toy created by the groups on a series of measures.

14 A room is prepared with all the toy drawings, descriptions and reasons why they were creative displayed on the wall. The toys are presented in one of three random orders (the display is changed for different sessions of judges).

15 Participants are first invited to read the instructions of the toy task and take an overview of all the toys.
They are given booklets to indicate their ratings.

They are asked to rate each toy on its overall creativity from 1 = "not at all creative" to 10 = "extremely creative".
Then, they are asked to indicate their ratings on sub-dimensions of creativity, pertaining to originality (i.e., originality, novelty, innovativeness) and appropriateness (i.e., usefulness, appropriateness, practicality). All the criteria are evaluated on ten-point scales.
Finally, peer judges have to indicate how many euros they think parents would be willing to pay for each toy and complete a final questionnaire including demographics.

16 Inter-rater agreement is computed for each item and if the cronbach alpha is acceptable (over 0.60), the ratings of all the judges are averaged for each item. The average scores for creativity and items pertaining to originality are entered in a factor analysis to confirm they load on one factor, and the same is done for the items pertaining to appropriateness. If it is the case, an average composite score is computed for the originality of the toys, and the same for the appropriateness of the toys.

An index is also created for estimated parents' willingness to pay by averaging the amounts given for each toy by judges (provided the inter-rater agreement is high). This index is then logtransformed if it is not normally distributed according to a Kolmogorov-Smirnov test.

## Statistical analyses

17 Different statistical methods are used depending on the level of the dependent variables. Covariates are included in the model for the replication measures following Przybylski and Weinstein (2013).

See table below for the analysis corresponding to each category of dependent variables.



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| A | B |
|---|---|
| **Category of dependent variables** | **Main analysis** |
| Relationship measures (Przybylski and Weinstein 2013) | Multilevel analysis: random intercept model with mere presence of smartphone as level-2 fixed effect, and gender, age and positive affect covariates as level-1 fixed effects |
| Creativity scores of group toys rated by peer judges | *t* test: mere presence of smartphone as predictor (no covariates) |
| Remote associates test | Multilevel analysis: random intercept model with mere presence of smartphone as level-2 fixed effect (no covariates) |
| Self-assessments of creativity | Multilevel analysis: random intercept model with mere presence of smartphone as level-2 fixed effect (no covariates) |
| Creative measures | Multilevel analysis: random intercept model with mere presence of smartphone as level-2 fixed effect (no covariates) |



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