Does smartphone application use impact adolescents' affect? Or vice versa? An experience sampling study

Michaela Šaradín Lebedíková, David Lacko, Michał Tkaczyk, Jana Blahošová, Steriani Elavsky & David Smahel

The data described/study is from the project „Research of Excellence on Digital Technologies and Wellbeing CZ.02.01.01/00/22_008/0004583", which is co-financed by the European Union.

Co-funded by the European Union

Ministry of Education, Youth and Sports of the Czech Republic

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Background

(Dienlin & Johannes, 2020; Parry et al., 2021; Pew Research Center, 2024; Tomczyk & Selmanagic Lizde, 2023; Valkenburg et al., 2024)

- Nearly all adolescents use smartphones several hours a day
- Meta-analytic evidence: small, but negative media effects
- Theory: people use media to improve their mood

At least 3 shortcomings can be improved:

- Ecologically valid experience sampling instead of experiments
- Deeper look into between- and within-person effects
- Trace data instead of self-reported smartphone use

The premise of mood optimization

(Reinecke, 2016; Wadley et al., 2020; Zillman et al., 1988)

- People are motivated to improve or maintain their positive affective state and terminate or reduce their negative affective state
- Two directional assumptions:
  - Affective states drive subsequent smartphone use (media selection)
  - Smartphone use is linked to subsequent changes in affective states (media effect)

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Hypotheses

RQ1: What is the association between time spent in social applications and positive (RQ1a) and negative affect (RQ1b)?
H1: An increase in adolescents' time spent in social apps is associated with a subsequent increase in positive affect (H1a) and a decrease in negative affect (H1b).
H2: A decrease in adolescents' positive affect (H2a) and an increase in negative affect (H2b) are associated with a subsequent increase in time spent in social apps.
RQ2: Is there effect heterogeneity in within-person effects between affect and social application use, and if so, how are these effects distributed?

RQ3: What is the association between time spent in entertainment apps and positive (RQ3a) and negative affect (RQ3b)?
H3: An increase in adolescents' time spent in entertainment apps is associated with a subsequent increase in positive affect (H3a) and a decrease in negative affect (H3b).
H4: A decrease in adolescents' positive affect (H4a) and an increase in negative affect (H4b) are associated with a subsequent increase in time spent in entertainment apps.
RQ4: Is there effect heterogeneity in within-person effects between affect and entertainment application use, and if so, how are these effects distributed?

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Social and entertainment applications

- Shared logic of media selection and media effect under mood management and emotional regulation theories
- BUT… differences in affordances:
  - Social structuration: social applications ↑, entertainment applications ↓
  - Control over content exposure: social applications ↓, entertainment applications ↑
  - Length and nature of use: social applications ↓, entertainment applications ↑

Method

- N = 197, 13-17 y.o., 58.38% boys
- Experience sampling (4 x 14 days x 4 daily surveys; $N_{occasions}$ = 17,580; May 2021-2022)
- Ethics: written consent from parents + participants, compensation via lotteries
- Measures:
  - Time spent in social (communication + social media) and entertainment (video, gaming, reading, music) applications
  - Positive and negative affect (six emotional states for each)
- Analytical approach: DSEM
- OSF: https://osf.io/nyxc5/

MEDIA SELECTION

60 min of use → affect

MEDIA EFFECT

affect → 60 min of use

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Results: social applications

RQ1: What is the association between time spent in social applications and positive (RQ1a) and negative affect (RQ1b)?

→ **Time spent in social applications is associated with higher negative affect. No association for positive affect.**

H1: An increase in adolescents' time spent in social apps is associated with a subsequent increase in positive affect (H1a) and a decrease in negative affect (H1b).

→ **Spending more time in social applications than usual results in increased negative and decreased positive affect, but effect sizes are negligible.**

H2: A decrease in adolescents' positive affect (H2a) and an increase in negative affect (H2b) are associated with a subsequent increase in time spent in social apps.

→ **Changes in affect were not related to the subsequent time spent in social applications.**

RQ2: Is there effect heterogeneity in within-person effects between affect and social application use, and if so, how are these effects distributed?

→ **Almost no effect heterogeneity.**

Results: entertainment applications

RQ3: What is the association between time spent in entertainment apps and positive (RQ3a) and negative affect (RQ3b)?

→ **Time spent in entertainment applications is associated with lower positive affect. No association for negative affect.**

H3: An increase in adolescents' time spent in entertainment apps is associated with a subsequent increase in positive affect (H3a) and a decrease in negative affect (H3b).

→ **Spending more time in entertainment applications than usual is not associated with changes in negative or positive affect.**

H4: A decrease in adolescents' positive affect (H4a) and an increase in negative affect (H4b) are associated with a subsequent increase in time spent in entertainment apps.

→ **Higher positive affect than usual is followed by less time spent in entertainment applications. No effect for negative affect.**

RQ4: Is there effect heterogeneity in within-person effects between affect and entertainment application use, and if so, how are these effects distributed?

→ **Almost no effect heterogeneity.**

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Practical meaning of results

- Spending time in social media worsens mood, not improves it
  - So why would adolescents use social media? (cf. Shi et al., 2023)
- Changes in mood do not prompt social applications use
  - Similar results to Elmer et al. (2025), but de Segovia Vicente et al. (2025) found that such media selection process is mediated by negative affect expression or avoidance in adults
- Using entertainment applications does not change affect
  - While inconsistent with mood management, consistent with existing evidence (e.g., Bradley & Howard, 2023)
- Higher-than-usual positive affect results in lower entertainment use
  - In line with theories, being in a good mood does not prompt regulatory needs

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Conclusion & limitations

– Future research should tackle limitations regarding time spent measure, application classification, and the specification of relationships (amount of media use, dose-response assumption, length of media effect – cf. Klingelhoefer et al., 2025)

Conclusion:

– Discrepancy between theoretical expectations and findings
– The negative impact of social applications on affect is very small

Thank you!

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saradinlebedikova@fss.muni.cz
www.irtis.muni.cz

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