Adolescent Mental Health and Digital Technology

Candice L. Odgers
NAS COMMITTEE ON THE IMPACT OF SOCIAL MEDIA ON THE HEALTH EFFECTS OF ADOLESCENTS AND CHILDREN; JAN 2023
5 Key Findings

1. Associations between digital technologies (including social media) are smaller than most assume, with few opportunities to separate cause from effect.

2. Longitudinal and within-person designs suggest social media may be on the wrong side of most equations.

3. Fears that social media is addictive and harmful to adolescent mental health and wellbeing are high, including among adolescents themselves.

4. There may be a “new digital divide” emerging in online spaces between adolescents at greatest risk for mental health problems and their peers.

5. Adolescents are going online to seek information and support for mental health problems, but few reliable or youth-centered solutions exist.
Associations between digital technologies are smaller than most assume, with few opportunities to separate cause from effect.
What does the evidence say?

# Recent Reviews & Meta-Analyses

<table>
<thead>
<tr>
<th>Author</th>
<th>Review Details</th>
<th>Overall Findings</th>
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</thead>
<tbody>
<tr>
<td>Valkenberg et al. 2022</td>
<td>Analyzes 25 reviews from 2019-2021</td>
<td>Use of social networking sites is weakly associated with both lower and higher levels of wellbeing across studies.</td>
</tr>
<tr>
<td>Hancock et al. 2022</td>
<td>Analyzes 226 studies between 2006-2018</td>
<td>Social media use was not associated with overall wellbeing, with an effect size equal to approximately zero. Small positive associations between SMU and social wellbeing, depression and anxiety. Among 24 longitudinal studies no evidence SMU predicts worse wellbeing.</td>
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<tr>
<td>Orben. 2020</td>
<td>Reviews 80 systematic reviews and meta-analyses</td>
<td>Small negative correlation between digital technology use and adolescent wellbeing, but it is not clear whether this represents a clear causal relationship or an association driven by third factors.</td>
</tr>
<tr>
<td>Odgers &amp; Jensen. 2020</td>
<td>Review of meta-analytic, large-scale and longitudinal studies</td>
<td>Mix of small positive, negative and mostly null associations, with almost all evidence coming from cross-sectional observational studies with no way to support strong causal inference.</td>
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<tr>
<td>Ivie et al., 2020</td>
<td>Analyzes 12 studies between 2011 and 2018</td>
<td>Small but significant positive correlation ($r=0.11$, $p&lt;0.01$) between adolescent social media use and depressive symptoms, with high heterogeneity</td>
</tr>
<tr>
<td>Keles et al., 2019</td>
<td>Review of 13 studies between 2011 and 2018 of adolescents</td>
<td>Overall association between social media use and mental health problems, but evidence is correlative, not causative.</td>
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</tbody>
</table>

- Mix of small negative, positive and mostly null findings
- Virtually all studies are correlational – no way to distinguish cause from effect
- Over-reliance self-report and single informant studies & on measuring time spent online
- New longitudinal studies suggests early depression predicts later social media use, but not vice versa
- One-size fits all approach to modeling and explanations
Large Surveys and Open Science

Monitoring the Future Study (MTF), SCA Results
(Orben & Przybylski, 2019)

the median standardized regression from the SCA: $\beta = -0.005$ (partial $\eta^2 < 0.001$, median $n = 78,267$, median standard error = 0.003)

Our Recent Analysis of MTF
Social Media Use and Depressive Symptoms Among United States Adolescents
(Kreski, Platt, Rutherford, Olfson, Odgers, Schulenberg & Keys, 2021)

Association did not differ by propensity for depression; only present for low-risk girls ($\beta = .018$, [CI]: .004, .031)

From 2009-2017, correlation between social media and depressive symptoms reduced to $ns$

“...contrary to the popular narrative, daily social media use is not a strong or consistent risk factor for depressive symptoms.”
Longitudinal research suggests social media may be on the wrong side of most equations.
Depressive symptoms predict later social media use (girls only), but not vice versa

Table 2. Autoregressive Cross-Lagged Model Results for Adolescents

<table>
<thead>
<tr>
<th>Structural path</th>
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</thead>
<tbody>
<tr>
<td>Soc.Media1→Dep.2</td>
<td>−0.022</td>
<td>−0.043</td>
<td>[−0.159, 0.073]</td>
</tr>
<tr>
<td>Dep.1→Soc.Media.2</td>
<td>0.287</td>
<td>0.131*</td>
<td>[0.026, 0.236]</td>
</tr>
<tr>
<td>Soc.Media1→Soc.Media.2</td>
<td>0.658</td>
<td>0.612***</td>
<td>[0.513, 0.711]</td>
</tr>
<tr>
<td>Dep.1→Dep.2</td>
<td>0.573</td>
<td>0.546***</td>
<td>[0.454, 0.638]</td>
</tr>
</tbody>
</table>

Taylor Heffer¹, Marie Good², Owen Daly¹, Elliott MacDonell¹, and Teena Willoughby¹
Nomothetic vs. Idiographic

Using MLM we can ask both “who” and “when” questions
Daily Data via Mobile Devices

Study Design

T1 Survey
N=2104

T2 EMA
N=388

Legend
- 10 participants
- T1 Survey Sample
- T2 EMA Sample

Percentage of Families in Poverty:
- 0%-7.81%
- 7.82%-18.32%
- 18.33%-31.34%
- 31.35%-51.01%
- 51.02%-100%

Population Representative
Daily Data via Mobile Devices

No daily linkages between digital tech usage and daily mental health

Only link: adolescents more connected via texts reported better wellbeing; similar daily findings
Only link: adolescents more connected via texts reported better wellbeing; similar daily findings.

Exploratory Analyses: no moderation that survived FDR correction across 96 tests.

No support for stronger daily coupling between SM and symptoms among adolescents at higher risk for mental health problems.
Only link: adolescents more connected via texts reported better wellbeing; similar daily findings

Michaeline Jensen, UNCG

Madeline George, RTI
Fears that social media is addictive are high, including among adolescents themselves.
• Virtually all teens endorse impairment or addiction related to their digital tech use

• But few reliable linkages between SM use with standardized test scores, child or parent-reported symptoms were found

• Caution for future research: addictive vs. neutral framing modifies findings (Hancok et al., 2022) and threats due to non-blinding in experimental approaches
New Digital Divide
Virtually all of U.S. adolescents now have access to a mobile phone.

Teens spend 7.5 hours on media screen time.
- Teens in low-income households spend, on average, 1.5 to 3 hrs more per day on screens.

Odgers & Robb, 2020; Common Sense Census, 2019; Pew 2018.
In Europe, smartphone ownership among young people aged 9 to 16 is 46%, according to a 2014 survey of 7 countries.

Smartphones are bad for some teens, not all
Young people who are already struggling offline might experience greater negative effects of life online, writes Candice Odgers.

“Opportunity gaps” and segregation in online spaces


Opportunity gaps and segregation in online spaces

Social-Media Spillover
In an unpublished survey of 2,100 US teens, those from low-income families are more likely than their affluent peers to report offline problems stemming from use of social media.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Disadvantaged</th>
<th>Non-disadvantaged</th>
</tr>
</thead>
<tbody>
<tr>
<td>Face-to-face argument</td>
<td>紫色</td>
<td>青色</td>
</tr>
<tr>
<td>Trouble at school</td>
<td>紫色</td>
<td>青色</td>
</tr>
<tr>
<td>Physical fight</td>
<td>紫色</td>
<td>青色</td>
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Percentage of adolescents reporting problems
Adolescents are going online to seek information and support for mental health problems, but few reliable or youth-centered solutions exist.
Adolescents are seeking help and support online

✓ 87% of adolescents have gone online to seek out information about mental health (Rideout & Fox, 2018)
  • 42% for anxiety & 30% for depression
  • Depressed adolescents more likely to seek support
  • Most report SM as providing social support

✓ Some evidence of effectiveness for digital mental health interventions (Hollis et al, 2017), but adolescents often left out of the design and delivery of these solutions

✓ Research-to-practice gap; close to 50% of teens report desire to use an app, but only 6% have used (Grist, 2018)
Additional Resources

2020
TWEENS, TEENS, TECH, AND MENTAL HEALTH:
COMING OF AGE IN AN INCREASINGLY DIGITAL, UNCERTAIN, AND UNEQUAL WORLD

Engaging, Safe, and Evidence-Based
WHAT SCIENCE TELLS US ABOUT HOW TO PROMOTE POSITIVE DEVELOPMENT AND DECREASE RISK IN ONLINE SPACES FOR EARLY ADOLESCENTS
Where do we go from here?

The usual set of recommendations for future research hold, including:

• Research designs that can support causal inference
• Moving beyond screen time and time on social media to capture use
• Less reliance on only self-reported digital tech use and mental health
• Movement away from a one-size fits all theories, models and data

A more radical departure:

• Stop investing resources, time, and energy asking the same question(s) that cannot be answered with the data in hand
• Need for within platform A/B testing and innovative approaches to within-person assessments and micro-interventions
• Greater investment and experimentation with digital mental health and social support for young people in the spaces where they are spending their time.
Contact & Team

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