The Broken Pipeline: Challenges in Disseminating Research on Adolescent Digital Media Use

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Abstract

Since its inception, digital media has become nearly ubiquitous in adolescents' everyday lives. Public discourse surrounding online platforms has fueled research exploring how digital media contexts may be affecting adolescent development. However, distinct features of digital media have imposed unique challenges on research dissemination, thereby limiting its accessibility for adolescents, parents, and community members (e.g., educators, policy makers) who it may benefit the most. In this review, we examine pressing issues confronted by adolescent digital media use researchers which may be impending effective translation of findings. Drawing from other disciplines, we offer integrative suggestions for communicating data on adolescent digital media use to adolescents, parents, and the public in accessible, practical, and beneficial ways. Recommendations include involving participants in dissemination processes, reframing translation as an iterative process, proposing actionable and practical solutions, and using appropriate materials and platforms for the target population. While the proposed strategies to improve dissemination address unique characteristics of adolescent media use research, they may be applied to a range of topics and disciplines.

Keywords: Adolescent development, digital media, accessible dissemination, effective translation, research methods

Public significance statement:

Drawing from other disciplines, this review highlights the current gaps and offers future strategies to ensure that adolescent digital media use research is disseminated in a timely and accessible manner. Improving research dissemination practices will ensure research findings are communicated effectively to the populations and communities they impact the most.

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Use

The proliferation of new and increasingly complex digital media has provided individuals with constant and novel opportunities to explore, interact with others, and express themselves; thereby creating a context which is nearly ubiquitous worldwide – particularly within adolescent populations (Bhanderi et al., 2021; Rideout et al., 2022). Referring to both the hardware components (e.g., smartphones, computers) and software platforms (e.g., applications), 'digital media' encompasses a variety of media including online messaging, electronic/video games, social media, and other apps for digital communication (Subrahmanyam & Michikyan, 2022). Youths' unprecedented use of digital media comes as no surprise given the characteristic physical and socioemotional changes that occur during adolescence, which heighten individuals' sensitivity to social information (Blakemore & Mills, 2014; Somerville, 2013). As a result, digital media contexts have become a primary learning environment which may be reshaping the landscape of adolescent development (Magis-Weinberg et al., 2021; Voogt & Knezek, 2021).

Driven, in part, by the increasing public discourse on the matter (Newport, 2021; Rogers, 2019), researchers have devoted time and resources into investigating the impact of digital media use on adolescent development. However, unique features of digital media have complicated the process of research dissemination, increasing inaccessibility for community members (e.g., policy makers and educators), parents, and even adolescents themselves. Neglecting this crucial step of the research process can result in the distribution of slow-moving, contradictory, and often unhelpful findings (Brownson et al., 2018), which limits the effectiveness of social media research for the individuals it most directly impacts. In this review we will address some of the most pressing challenges faced by adolescent digital media use researchers when disseminating

and translating research findings. We then turn to other disciplines to propose multidisciplinary solutions for communicating research findings in accessible, actionable, and appropriate ways.

Acknowledging that our social identities as researchers affects how we view and interpret our social world and subsequently create knowledge (Jacobson & Mustafa, 2019), it is important to share our positionality to better situate the current study and be aware of how our identities may be impacting our research. The team writing this review includes a faculty member – a White cis-gender woman and mother of a toddler with expertise in adolescence and developmental neuroscience, a graduate student - a Latina woman and doctoral student in psychology and neuroscience who has completed coursework in community-engaged research - and an undergraduate student – a White cis-gender woman and college student majoring in psychology who began working with us three years ago as a teen advisory board member.

Identified problems in research dissemination

The existing pressure to balance communicating robust and accurate messages about the data and doing so in ways that are appropriate, effective, and practical for the community is widespread among social science researchers (Fook & Gardner, 2007). However, digital media contexts have unique features which may affect the process of dissemination. Resulting from these characteristics of digital media, researchers are facing unique challenges when disseminating their findings. In the following section we will explore some of the barriers and challenges faced by researchers aiming to disseminate findings on adolescent digital media use.

Systemic barriers for dissemination

While there are researcher-level changes that may improve dissemination practices beyond scientific publication, there are significant systemic issues that may prevent the implementation of such changes. Indeed, a recent study found that only 66% of individual

researchers believe their organizations or institutions support them to engage in dissemination and implementation research and that this is often perceived to be less 'valued' within the broader academic community (Koorts et al., 2020). Indeed, lack of institutional incentives has been repeatedly cited as a significant barrier for dissemination and translation (Fraser, 2004; Jacobson et al., 2004; Jessani et al., 2017). Other barriers include a historical linear approach towards evidence generation, limitations of resources and funding, and methodological challenges of real-world research (Koorts et al., 2020). Addressing these systemic barriers will better enable researchers to prioritize and strengthen their own individual dissemination practices.

Causal links

Much of the research exploring adolescent digital media use has been non-experimental with investigators often observing behaviors, analyzing self-report surveys, or conducting focus groups. However, there is a widespread taboo amongst psychologists against explicitly drawing causal inferences from nonexperimental research designs (Grosz et al., 2020). While some have argued this hinders psychology research (Antonakis et al., 2010; Grosz et al., 2020) many academic researchers feel unable to make causal inferences regarding the impact of adolescent digital media use (Odgers & Jensen, 2020). This complicates dissemination practices given that causal relationships between digital media use and adolescent development are of central interest for adolescents, parents, and community members (Newport, 2021; Rogers, 2019). Unsatisfied by the noncausal claims, the public may begin to draw their own conclusions and interpretations about research findings even if these are unwarranted or inaccurate. As a result, when disseminating information, researchers face the challenge of providing enough information to

satiate public interest without making claims that go beyond their own methodological limitations.

Digital divide

Technological advancements have created divides between individuals who were socialized in different media contexts (Tapscott, 1998). The term 'digital divide' has classically been used to explain the differences in digital literacy between younger generations who grew up with access to digital media contexts and older generations who did not (Palfrey & Gasser, 2008). However, despite the newest generation of parents having grown up in a digital age themselves (Fishel, 2012; McDaniel et al., 2012), there are still significant divides in digital know-how between each generation given the unprecedented rate at which new digital media applications have developed. Differential knowledge about digital environments, coupled with existing fear-based narratives surrounding adolescent digital media use (Orben, 2020b), may be triggering a confirmation bias where older generations are more prone to search for, believe, and promote evidence which supports a dystopian narrative while rejecting opposing scientific findings (Hornsey & Fielding, 2017) thereby standing in the way of effective research dissemination. These digital divides can also exist between researchers and the adolescent populations they study, which may result in scientific questions, interpretation of the results, and communication of findings that are inaccurate portrayals of adolescent digital media use.

Dissemination targeted at academics

Given the significant value academic institutions have placed on scholarly publications, adolescent digital media use research has primarily targeted other academic researchers via articles published in peer-reviewed academic journals, conference presentations, and on academic social media (e.g., academic twitter, academics on mastodon) (Egli et al., 2019).

However, this method of dissemination is often inaccessible to the adolescents, parents, and other community members who are most directly affected by the findings. Indeed, the majority of readers of social science journal articles are academics or other researchers (Mohammadi et al., 2015) given that major barriers such as the expensive subscriptions, time required to read articles, and "information overload" may limit accessibility for the general public (Brownson et al., 2018; Revere et al., 2007). While outlets such as *The Conversation* or *BrainPost* have been created with the hopes of bypassing these barriers and facilitating dissemination to non-academic audiences, these are not well known by the general public and thus research findings remain largely inaccessible.

Delayed dissemination

Alongside the questions of *where* research is disseminated comes the question of *when* it is disseminated. Dissemination of research findings is typically considered the final step in the research process, following the development of a research question, data collection, and interpretation of analyses. As a result, there is often significant lag time between when research starts and when findings are disseminated (Israel et al., 2001). Given that the rate of digital media growth typically outpaces the rate at which research is conducted, research findings may quickly become irrelevant or obsolete, therefore limiting the usefulness and effectiveness of dissemination practices. Furthermore, this lag time can be vary depending on study design with some studies requiring several months or years of data collection. If dissemination is seen as the ultimate step in the research process, parents and teens may not have access to findings that may impact them for multiple years. This is particularly relevant given that researchers are calling for longitudinal studies to better understand the effects of digital media on adolescent development

(Prinstein et al., 2020). For this reason, researchers must contend with the challenge of sharing

information that is applicable and relevant about a dynamic digital landscape.

Ubiquitous yet individualized

Digital media is highly ubiquitous among adolescents all over the world. However,

digital media is also influenced by social, environmental, political, and cultural contexts

(MacKenzie & Wajcman, 1999) and thus may be highly individualized. Indeed, researchers have

found that adolescents' digital media use, behaviors, and experiences may be impacted by their

racial-ethnic identity (Florini, 2014), sexuality and gender (Craig & McInroy, 2014; DeHaan et

al., 2013), and culture (Manago & Pacheco, 2019). However, researchers exploring how digital

media contexts, which are both omnipresent and personalized, impact adolescent well-being

have found positive, negative, and even null correlations (for reviews see Best et al., 2014; James

et al., 2014; Sarmiento et al., 2020; Orben 2020a). In fact, despite over 80 systematic reviews

and metanalyses looking at a range of populations (Dickson et al., 2018), researchers have not

reached a consensus on the impact of social media on adolescent development. These discrepant

research findings tend to complicate dissemination practices given that communicating

conflicting information may spur confusion and further misunderstandings within adolescents,

parents, and community members. As a result, researchers use must communicate research

findings with caution to avoid misinterpretations by broader audiences.

Recommendations for research dissemination

Many of the challenges faced when researching the impact of technology on adolescent

development are not unique to the field of psychology. Similar challenges have been reported by

researchers examining adolescent digital media use in sociology, communication, and public

health (Bannor et al., 2017; Literat & Brough, 2019; MacKenzie & Wajcman, 1999). Drawing

from experiential knowledge of researchers in other fields, developmental psychologists may find creative solutions which will help improve the accessibility and efficacy of data dissemination and ensure a more reciprocal and less extractive research processs (Egli et al., 2019). In the following section, we look to other disciplines to identify potential solutions through which they have overcome the challenges associated with adolescent digital media use research. Adopting an interdisciplinary approach to dissemination can provide developmental psychologists with different translation methodologies to ensure widespread understanding and relevance of data to the individuals who will benefit from it the most (Bernhardt et al., 2011; Lord et al., 2019).

Incentivization of dissemination in academia

To provide better support for individual researchers to engage in dissemination and translation of research findings, public health scholars have identified systemic incentives that may appeal to other academic researchers (Fraser, 2004; Jacobson et al., 2004; Jessani et al., 2017). These include monetary support to fund dissemination practices, receiving professional recognition for the energy and effort required to disseminate research, academic promotion that takes into consideration dissemination of research, and capacity enhancement within their academic training to effectively teach scholars how to disseminate research (Jessani et al., 2020). By adopting these incentivization strategies, institutions reorient the values they place on engaging in and supporting dissemination practices which may help individual researchers do the same. Importantly, while addressing systemic barriers can allow researchers to prioritize dissemination practices, there are smaller-level changes that can help promote research dissemination's effectiveness and utility.

Participant-driven dissemination practices

A key practice seen among multiple disciplines is that of engaging participants and community members in planning and executing dissemination efforts through community based participatory research (CBPR) practices (Cacari-Stone et al., 2014; Minkler & Salvatore, 2012). Defined as a collaborative process between researchers and participants alike, CBPR aims to build on the strengths of all parties to combine knowledge and action for social change (W.K. Kellogg Foundation Community Health Scholars Program, 2001). Acknowledging the significant role that parents and community members play in shaping adolescents' access to digital media (Iqbal et al., 2021), dissemination practices will benefit from including their perspectives (Auxier & Anderson, 2021). Indeed, cooperation between community partners and researchers during dissemination strengthens communication and can promote greater exposure of research, more consistent messaging themes (Lambert et al., 2014), and ensure dissemination materials appropriately capture nuances that may exist within the community (Madill et al., 2014). Given youth's high digital media use patterns, one form of CBPR which may be particularly relevant is youth-led participatory action research (YPAR) in which adolescents conduct research and advocate for changes to improve conditions that affect their development and well-being (Ozer et al., 2017). YPAR may enhance the validity of dissemination practices because youth researchers with insiders' perspectives can ensure the portrayal of results will be received and interpreted in the intended way (Egli et al., 2019).

Reframing dissemination as an iterative process

To address the 'lag time' which may be impacting the relevance of disseminated research findings, investigators have proposed reframing the dissemination timeline such that this is not viewed as the final step but rather an iterative process that occurs at multiple timepoints throughout the project (Arcia et al., 2016; Roman et al., 2010; Yousefi-Nooraie et al., 2021). For

example, one study provided adolescent participants with a summary of their individual data

immediately following their participation, a collective summary of data from their school peers

after data collection had finished, and analyzed research findings once these were completed

(Egli et al., 2019). Presenting participants with feedback at multiple intervals allows for more

timely dissemination of data, fosters participant engagement in research, and enhances

understanding of research findings (Arcia et al., 2016; Yousefi-Nooraie et al., 2021). Continuous

dissemination may be particularly effective for longitudinal study designs as this can prevent

participant drop-out and attrition throughout data collection (Roman et al., 2010). Furthermore,

having multiple rounds of dissemination allows researchers to share information to broader

audiences (Egli et al., 2019). For example, while the summary of individual data can be most

relevant for adolescent participants and their parents, the summary of school data may also be

helpful for teachers and administrative staff, and the analyzed data can be shared more publicly.

Disseminating actionable solutions

To overcome the methodological limitations that hinder causal inferences, researchers in

other disciplines have proposed acknowledging the limitations of the statistics being shared and

accompanying this with actionable behaviors that adolescents, parents, or community members

may take in response (Whitehead et al., 2003). As a result, the public will be better equipped to

use these statistics to develop their own strategies for promoting healthy adolescent development

within digital social contexts and will be less likely to form unwarranted conclusions. Support

for this strategy was evidenced by adolescents who reported not wanting to be preached to about

healthy development, but rather given guidelines and stimulated to think about potential

solutions they might apply themselves within their own communities (Macario et al., 2013).

Additionally, it is suggested these actionable recommendations focus on individual and

community strengths rather than deficits or problems (Egli et al., 2019). Framing research findings with a strengths-based approach will encourage adolescents, parents and community members to capitalize on their own resources to address adolescent digital media use.

Multi-modal dissemination strategy

Dissemination practices should target and be accessible to the individuals most directly impacted by the research (Baker et al., 2021). This often requires a multi-modal strategy where information is distributed across a variety of platforms and outlets to ensure the findings reach a widespread audience. Given its ubiquity, the utility of social media to disseminate research to adolescents should not be overlooked (Pulido et al., 2018). In fact, sharing information on social media allows for both timely and persuasive dissemination via mass media channels and relational communication channels respectively (Lord et al., 2019; Zhang et al., 2014). Furthermore, the quantifiability of digital media enables researchers to ensure target audiences are interacting with the disseminated materials (Egli et al., 2019). As a result, social media can be an effective platform through which to share research findings to adolescents in fast and accessible ways. However, given that individuals trust social media communication to varying degrees (Zhang et al., 2014), dissemination can also take place via podcasts, blogs, videos, and digital media platforms, as well as in-person at community workshops or local fairs to ensure comprehensive dissemination of research findings (Bannor et al., 2017; Bernhardt et al., 2011; Macario et al., 2013; Madill et al., 2014).

Adopting a multi-modal approach to dissemination also affords researchers the opportunity to present complex research findings in more comprehensible and engaging ways. Indeed, scientists have found that using models, diagrams, videos, and infographics can help communicate intricate and detailed messages to children and adolescents (Arcia et al., 2016;

Baker et al., 2021; Brannen & Nilsen, 2002). This is particularly relevant for researchers exploring the effects of digital media contexts on adolescent development given the complexity of both novel digital contexts and adolescents themselves. Other disciplines have also recommended that dissemination materials be interactive in order to allow adolescents to engage with findings more deeply (Bernhardt et al., 2011; Straus et al., 2009). For example, disseminating research findings on a website that allows adolescents to post their thoughts or ideas in response to these research findings. Giving adolescents the opportunity to change and adapt dissemination materials can make the research findings more meaningful and may result in them being used and more readily applied (Straus et al., 2009).

Conclusion

Researching the impact of digital media on adolescent development is not an easy feat however, proper dissemination practices have the potential to improve the wellbeing of adolescents, parents, and community members. Unique features and characteristics of digital media contexts have brought about distinct obstacles which researchers must face during research dissemination. However, by drawing on other disciplines, researchers can find integrative solutions for communicating data in accessible, applicable, and achievable ways to the individuals most impacted by the findings. Notably, while effective dissemination is a tool which may promote the social impact of research, it should not be used as a method to assess this (Pulido et al., 2018). Following dissemination of data, scientists should observe the impact of research findings on the behaviors, practices, and experiences of adolescents in digital media contexts. Only then can they ascertain whether social improvements are being achieved through science.

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