



What Is Digital Parenting? A Systematic Review of Past Measurement and Blueprint for the Future

Kathryn L. Modecki¹ , Rachel E. Goldberg²,
 Pamela Wisniewski³, and Amy Orben⁴

¹Menzies Health Institute Queensland, School of Applied Psychology, Griffith University;
²Department of Sociology, University of California, Irvine; ³Department of Computer Science,
 University of Central Florida; and ⁴MRC Cognition and Brain Sciences Unit, University of Cambridge

Abstract

Concerns about parenting adolescents are not new, but the rapid diffusion of digital technologies has heightened anxieties over digital parenting. Findings are decidedly mixed regarding the impact of digital technologies on adolescent well-being, and parents are left to navigate their concerns without an empirically based road map. A missing link for understanding the state of the science is a clear characterization of how digital parenting is measured, including an evaluation of which areas demand an outsized share of scientific attention and which have been overlooked. To address this gap, we undertook two interdisciplinary systematic reviews of the digital-parenting literature and characterized measurement across (a) quantitative surveys ($n = 145$ studies) and (b) qualitative focus groups, interviews, codesign studies, and user studies ($n = 49$). We describe previously popular areas of survey measurement that are of decreasing relevance to parenting of digital spaces (e.g., co-use, hovering). We likewise highlight areas that have been overlooked, including consideration of positive uses of digital technologies, acknowledgment of bidirectional influence, and attention to heterogeneity among families and to extraparental social ecologies of support and monitoring. We provide recommendations for the future of digital-parenting research and propose a more comprehensive approach to measuring how modern adolescents are parented.

Keywords

adolescent, adolescent development, digital parenting, interpersonal relations, family, measurement, technology use

You also want to make sure that your child engages in other activities, like mammoth hunting and the gathering of rocks and bones with which to make tools.

—Rachel Klein (2018, para. 2)

One indicator that an issue has captured societal attention is that it becomes the target of satire. Concerns about parenting in the digital age reached this point in 2018, when Rachel Klein wrote a caricature in *The New Yorker* about “limiting your child’s fire time.” In her “Guide for Concerned Paleolithic Parents,” Klein acknowledged the many beneficial applications of a “new” technology: in this case, fire. She then asserted that although adults who were born before fire’s advent

can readily moderate their use of fire, many children will struggle with self-monitoring their fire time.

Just like such prehistoric technology, today’s digital innovations afford parents and children with many useful applications (Livingstone et al., 2018; McClure et al., 2018; Modecki, Duvenage, et al., 2022; Moreno & Uhls, 2019). However, as Klein (2018) satirized, many parents fear new digital technologies could potentially harm their children (George & Odgers, 2015; Modecki, Low-Choy, et al., 2021; Radesky et al., 2016). These concerns have magnified over the last years because digital technologies have taken up increasing amounts of children’s

Corresponding Author:

Kathryn L. Modecki, Menzies Health Institute Queensland, School of Applied Psychology, Griffith University
 Email: k.modecki@griffith.edu.au

and adolescents' time and have crept into ever more areas of life (Odgers & Jensen, 2020). In 2018, almost 50% of U.S. teens stated that they are "almost constantly" online (Anderson & Jiang, 2018), and this percentage has risen substantially over the past years as much of daily life has moved onto digital-technological spaces during the global COVID-19 pandemic (Office of Communications, 2020).

Concerns about the impact of this rapid digitalization on children and adolescents are routinely voiced in both the scientific literature and popular press (Bell et al., 2015). Although some researchers have claimed the existence of a negative causal link between time spent on digital technologies and adolescent well-being (Twenge et al., 2018), others have voiced concerns that the evidence is not currently strong enough to warrant such conclusions (Heffer et al., 2019; Orben & Przybylski, 2019a). Indeed, many studies have found mixed or inconclusive evidence (Allcott et al., 2020; Jensen et al., 2019; Kreski et al., 2021; Orben & Przybylski, 2019b), and reviews have posited that such inconsistent findings may reflect individual differences and complex interactions (Beyens et al., 2020; Odgers & Jensen, 2020; Orben, 2020b).

There is a growing chasm between the evidence provided by the scientific literature and what is needed to create evidence-based guidelines about adolescent digital-technology use and how parents should respond (Viner et al., 2019). Digital-parenting behaviors are multifaceted and complex, including, for example, the monitoring of adolescent technology use, rule provision, enforcement, education and promotion of digital skills, navigation of online education, and the exploitation of online opportunities (Odgers, 2019). Yet there are currently no up-to-date technology-focused and developmentally focused tools, including questionnaires, to study this complex behavior. In the absence of questionnaires developed explicitly to understand contemporary digital parenting, researchers are left to repurpose existing measures developed for older technologies, such as the home television, or are left to design improvised items without the necessary validation processes.

This is hazardous territory. The evidence gap, missing future-research vision, and outdated measures necessary to understand and guide digital parenting leave parents largely unaided in seeking to navigate a rapidly developing space. A Pew Research survey administered in March 2020 found that two thirds of U.S. parents considered parenting harder today than it was 20 years ago; many attributed this development to new technologies, such as smartphones and social media (Auxier et al., 2020).

In this review, we aim to provide parents and researchers with the knowledge base they need to

understand the complexity of digital parenting and a blueprint for future digital-parenting research. To do so, we first summarize prior psychological approaches to parenting adolescents and evaluate the problems parents face in raising adolescents during a time of rapid technological change. We present current approaches to studying digital parenting using frameworks developed in media studies and communication sciences and then report findings from an interdisciplinary systematic review in which we examined how digital parenting has been measured and quantified to date. Subsequently, we present results from our complementary interdisciplinary systematic review of the qualitative literature on digital parenting, focused on the identification of key areas that current quantitative measurement has neglected or overemphasized. Our interpretation of the research landscape that follows summarizes these important insights and pinpoints opportunities for improved, developmentally informed psychological research on parenting in the digital age.

Essential Parenting Challenge: Fostering Both Independence and Safety

A fundamental developmental task in adolescence is to begin functioning as an autonomous individual. Adolescents must learn how to take responsibility for themselves and their choices and how to navigate new relationships and peers, novel situations, and untried possibilities (Allen et al., 1996; Collins et al., 1997; Soenens et al., 2007). Such autonomous functioning is part of a healthy transition to adulthood, regardless of whether youths are navigating these tasks face-to-face or digitally.

Tasked with nurturing this growing independence, parents and caregivers face their own balancing act. They seek to confer on youths the independence and autonomous functioning needed to achieve psychosocial maturity while providing sufficient monitoring and support to keep them safe (Erickson et al., 2016). How this tension is navigated has long-term implications for the parent-child relationship and for adolescents' development.

This challenge is not new and applies to both the offline and online realms. Indeed, decades of research have explored management of the parent-child relationship during adolescence. With the onset of puberty, youths traditionally spend less and less time at home and more time with peers, which leaves parents with fewer opportunities for direct supervision (Larson et al., 2002; Updegraff et al., 2006). In response, parents might implement *control strategies*, such as requiring adolescents to seek permission to go out, to provide information about adult supervision at their destination, or to

disclose whom they will be spending time with, what they will be doing, and when they will return home (Kerr & Stattin, 2000). Parents might alternately employ *solicitation strategies*, such as gathering information about what is happening in their adolescents' lives by asking them about their experiences, a technique that relies on adolescents' willingness to share information.

Parents might also elect to foster relationships in which their children disclose information on their own accord (Smetana et al., 2006; Tokić & Pećnik, 2011). This approach is generally considered more positive than control or solicitation strategies, given that some developmental theories argue that vigilant surveillance and active tracking are tied to poorer youth outcomes, in part because adolescents may come to doubt their capacity to make good decisions on their own accord if monitored too closely (Hunter et al., 2011). When youths self-disclose voluntarily, this is not only healthier for their adjustment, being tied to higher well-being and less risky behavior (Soenens et al., 2007), but also more effective because parents tend to learn more about adolescents' activities (Kerr & Stattin, 2000).

That said, the nature of such solicitation strategies appears to require sensitive judgment and a light hand. Some research points to particular hazards of inconsistent on-demand solicitation conversations with adolescents with the direct purpose of learning about their activities (Hawk et al., 2008). Such half-hearted use of solicitation strategies can contribute to mismatched perceptions of adolescents' agency, independence, and privacy rights, which can fuel turbulence in the parent-child relationship and increased secrecy and concealment on the part of the adolescent (Hawk et al., 2013). The idea here is that the direct nature of solicitation strategies in which parents seek information on demand, and do so intermittently, conflicts with adolescents' established expectations for privacy, which can then backfire in the form of increased secrecy and concealment (Hawk et al., 2013). All told, then, the goal for parents of adolescents is to develop children's independence while maintaining good knowledge of their activities: knowledge that ideally stems from a close, positive relationship in which adolescents feel open to regularly disclose and maintain a sense of their own personal boundary for privacy (Hawk et al., 2013).

Parenting Television Use

Despite robust evidence, this developmental understanding that parent-child relationship quality is crucial to balancing adolescents' needs for safety and autonomy has not yet permeated the science of digital parenting. Rather, a focus on adults' behavioral mitigation of risks and, to a lesser extent, quality of interpersonal

communication formed the foundation for many of the first explorations of parenting technologies (Clark, 2011). Inspired by Bandura's (1978) social-learning theory and its focus on parental modeling, researchers routinely put the parent (as opposed to the adolescent or the parent-adolescent relationship) in the foreground of this research (Clark, 2011). In doing so, lines of scientific inquiry focused on trying to understand parental "doing" behaviors that in turn might help ensure youths' safety and well-being in response to new technologies.

Foundational work on parental mediation of children's television viewing undertaken by Valkenburg and colleagues (1999) identified three cornerstone parental-mediation strategies: restrictive mediation, instructive mediation, and social coviewing. Restrictive mediation, also known as "rule making," encompassed parents setting boundaries and limiting television use. For example, parents might set time limits for viewing or restrict adolescents from viewing specific content. Instructive (also known as "active" or "interpretive") mediation involved caregivers discussing media content with youths. For instance, parents might highlight that certain aspects of a program are unrealistic. Finally, social coviewing referred to parents cowatching media content with their child but without engaging in content discussion. Note that social coviewing has been associated with enhanced feelings of closeness (Courtois & Nelissen, 2018).

It is noteworthy that Valkenburg et al. (1999) went to considerable lengths to highlight ways in which "media parenting" could not only reduce risks of television viewing but also enhance its potential benefits. For example, instructive mediation might modify attitudes toward television violence (a potential risk from media consumption) or bolster acceptance of nontraditional gender roles (a potential benefit). The digital-parenting lens has arguably narrowed since then, and there has been an increasing focus on parenting as a means of solely combating the risks of technology and not maximizing benefits (e.g., Nielsen et al., 2019).

Shifting From TV to Digital Technology

Despite marked changes in technology use since the turn of the millennium, Valkenburg et al.'s (1999) tripartite typology of restrictive mediation, instructive mediation, and social coviewing is still the main way in which researchers conceptualize and measure parenting of newer technologies, including youths' use of the Internet in general (Livingstone et al., 2017), screens (Nielsen et al., 2019), smartphones (Wisniewski et al., 2017), tablets (Beyens & Beullens, 2017), smart speakers (Garg & Sengupta, 2020), social media (Hamilton et al., 2020), and online gaming (Koning et al., 2018).

Even when researchers seek to devise updated parenting measures, the three typologies often reappear with little additional context or theory specific to the online space (Eastin et al., 2006).

Continued reliance on measures designed for older technologies means that key differences between older and newer technological developments often go unacknowledged (Chassiakos et al., 2016). For example, coviewing television is arguably far more common than coviewing when browsing the Internet (Eastin et al., 2006). When parenting adolescents' Internet use, parents are often left facing a proverbial "black box," one in which they know relatively little about their children's online activities (Gomez, 2017). As a result, parents may feel a loss of control over the process of affording youths greater freedoms.

Furthermore, modern digital technologies are far more interactive than their predecessors such that children act as both consumers and producers of content for increasingly public audiences. No longer is content solely about youths' own media intake—the output is perhaps even more important (Verduyn et al., 2020). This presents both opportunities for development and prosociality (Jones & Mitchell, 2016) but also new risks, such as the possibility of interacting with unsafe individuals (Jones et al., 2013).

Finally, digital technologies are more ubiquitous than older technologies, facilitate increasingly intensive and extensive contact with others (Blackwell et al., 2016), and are often used simultaneously with other devices (Anderson & Jiang, 2018). This omnipresence means that the boundaries between online and offline are increasingly blurred (Anderson & Jiang, 2018). Some have even argued that life is now "postdigital," meaning that the differentiation between online and offline worlds no longer applies (Taffel, 2016). Not only are youths fully immersed in the online world, but also their development occurs both online and offline, in a bidirectional, fluid manner (Vijayakumar & Pfeifer, 2020). From a parent's perspective, this means that youths' digital or postdigital developmental experience is increasingly opaque.

The Problem of Measurement

To address these changes in digital parenting brought about by the advent of modern digital devices and an increasingly immersive online world, researchers have sought new ways to measure digital parenting. Some have tried to augment existing parental-monitoring scales with responses for "online" contexts, often by adding an "online" option to an existing scale. Yet this does not ensure validity, and there is little to suggest that adding an additional domain to prior measures taps

into the experience of adolescents and parents today. Other scholars have been left to generate self-standing items to tap behaviors such as disclosure of cyberbullying, keeping passwords private, or technology "addiction" (e.g., Nikken & Jansz, 2006; Wang et al., 2005). Such on-the-fly scales, however, also often lack measurement quality and measurement invariance and have low reliability. They therefore are susceptible to poor or inadequate characterizations of modern family experiences (Flake et al., 2017). Key parenting dimensions, including autonomy building and support, are routinely overlooked in these stopgap operationalizations. Given that the arena of digital parenting directly feeds into recommendations to whole populations of parents, the field's issues with reliable and valid measurement are especially troublesome.

Previous Reviews and Reconceptualizations of Digital Parenting

Although several attempts to develop new approaches to conceptualizing digital parenting have been published, these studies often "pave the cow-path," to use vernacular from the field of human-computer interaction. That is, they follow traditional ways of conceptualizing problems rather than taking a holistic approach to reappraise digital parenting. For example, Chen and Shi (2019) conducted a meta-analysis of 52 studies that examined how Valkenburg et al.'s (1999) three forms of parental mediation influence youths' media use and online risk exposure. They found that over a third of included studies focused on television viewing and that the focal point was exclusively on risk mitigation. As a second example, Jago et al. (2013) surveyed 29 studies on media parenting and youths' screen viewing (e.g., television, Internet, and gaming) and adolescent obesity. They found that most studies failed to demonstrate construct validity and/or internal consistency of the measures used.

Perhaps the most notable call for updated measurement of digital parenting came from Valkenberg and colleagues (2013). They sought to develop a perceived parental-mediation scale based on Deci and Ryan's (2000) autonomy-support-in-parenting model. The scale was originally intended to capture use of the Internet as well as TV, movies, and digital games. The objective was to understand parents' behaviors and gauge parents' explanatory style, encouragement of children's opinions, and responses to noncompliance. However, subsequent challenges regarding the reliability and validity of some of the items resulted in Valkenberg et al. (2013) using only an abbreviated set of items, none of which concerned adolescents' Internet use.

The Importance of Considering Diversity in Digital-Parenting Research

Among the most vexing issues that a reconceptualization of digital parenting needs to address is heterogeneity among families (e.g., Hankerson et al., 2016; Modecki, Low-Choy, et al., 2021; Sugie, 2018). As described by Schlesinger and colleagues (2017), understanding the “user” of technology means acknowledging the different, overlapping attributes of a given user’s identity. Although scholars of human–computer interaction and digital race have historically pointed to race and class differences both in how families make use of technology and in norms and expectations regarding technology’s benefits and risks, such variation is too rarely considered in the psychological literature (London et al., 2010).

Population-based surveys and ethnographies have shown that technology usage looks markedly different depending on socioeconomic status (SES; Lauricella et al., 2016; Pater et al., 2015; Yardi & Bruckman, 2012). For instance, in the United States, low-income households are significantly more likely to be smartphone-only households without broadband Internet (Vogels, 2021). These families rely on smartphones for tasks typically designed for larger screens, sometimes referred to as the “homework gap” for youths who turn to phone screens for their course work and out-of-school study (Vogels, 2021). In lower income or homeless families, it is also not unusual for youths to resort to accessing educational technology at friends’ homes and at schools and libraries (Harpin et al., 2016). In 2015, smartphone-only homes represented 35% of U.S. lower income households with school-age children (Anderson & Perrin, 2018); yet the predominant narrative in developmental psychology remains that of risks related to overuse, such as phone addiction, cyberbullying, and the like (Kardefelt-Winther, 2014; Olweus, 2012). Addressing this incomplete characterization of family technology use requires both the employment of more diverse samples and measurement designed to capture such heterogeneity.

Parents also diverge in their hierarchies of concerns and parenting styles (Erickson et al., 2016), and technology use is by no means at the apex of worries for some families, especially those from marginalized contexts, such as foster families (Badillo-Urquiola et al., 2019). For example, lower income families have tended to view television as an accompaniment to everyday life that often contributes to family harmony, whereas higher income families have tended to have more concerns regarding negative influences (Clark, 2011). More recently, research has found that low-income families both more frequently share devices and give youths more autonomy over their own technology use (Yardi

& Bruckman, 2012) such that concerns about monitoring may be less prevalent (Lauricella et al., 2016). As one example, in low-income Latino homes in the United States, it is common for youths to lead families’ efforts to access online information, much the same way these youths are known to act as “knowledge brokers” offline in bilingual families (Pina et al., 2018). As a result, joint media engagement is relatively common in these families, but the impact on well-being of such collective use remains unknown (Pina et al., 2018).

Research agnostic to heterogeneity in family experiences, norms, and priorities may arguably give rise to a misleading picture of digital parenting. White middle-class samples are often held as the “normative” expectation, which ignores heterogeneity in availability of technologies, expectations and realities with respect to where and how youths gain access to digital devices, and family-privacy norms. Arguably, much past research—and particularly the research that has been most influential in the development of digital-parenting measures—has glossed over these types of compelling differences in families’ technology experiences and digital parenting. As a result, scholars have called for digital-media scholarship grounded in ethnographic and digital-race perspectives and a more integrated discussion of heterogeneity across the digital-parenting literature (e.g., Clark, 2011; Ellison & Solomon, 2019; Noble, 2018).

Toward a New Account in a Postdigital Age

Current approaches to understanding how parents monitor and support adolescent development in the digital age are arguably antiquated, fragmented, and riddled with ad hoc measurement. Yet the way researchers conceptualize, study, and understand the interface of parenting and technology is becoming ever more critical. Digitalization is expected to continue in the future, which means that a functional approach to digital parenting and accurate measurement of such parenting will become increasingly important if psychology is to support this area of contemporary concern.

As a result, it is critical to take stock of existing measures of digital parenting to understand where current work is falling short and offer a blueprint for ways to move the science forward. Arguably, measures need to correspond to actual adolescent technological behaviors and actual digital-parenting strategies. They need to capture both the spectrum of potential affordances from technology, whether negative or positive, and heterogeneity in technology use, parenting strategies, and parental approaches to technology.

To address the provisional status of measurement in the field, we took an interdisciplinary, novel approach to systematically inventory the many ways in which scholars have recently sought to measure and understand parental monitoring and support in relation to adolescents' technology use. The scope of this review was designed to encompass multiple fields: psychology, sociology, media and communication studies, and conference proceedings related to human-computer interaction and computer science. To better understand the breadth of digital parenting, we first systematically reviewed survey-based research to catalogue the array of items and scales researchers have used to operationalize digital-parental monitoring and support. We then further undertook a systematic review of the qualitative research that assessed digital parenting. This allowed us to identify constructs neglected, underemphasized, or overemphasized in survey research and put forward a new blueprint for measuring digital parenting.

Review of Survey Measurement of Digital Parenting

Identification of the literature

Our reviews of both the survey-based and qualitative literatures followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines for the reporting and conduct of systematic reviews (Moher et al., 2009). We ran a search of the literature in February 2019 that covered six databases chosen to span multiple disciplines and formats: Web of Science, PsycINFO, Ovid Medline, the Educational Resources Information Centre, Proquest Dissertations and Theses, and ACM Digital Library. The search employed a combination of keywords and subject terms that related concepts of tech devices or social media (e.g., "smartphone," "internet," "social networking site"), adolescents (e.g., "teen," "youth"), and parental monitoring or support (e.g., "parent" or "family" adjacent to "monitoring" or "involvement"). The full list of search terms and databases can be found in Section 1 of the Supplemental Material available online. We limited the search to studies that were published from 2008 onward (to capture the rise of smartphones), published in English, and published as peer-reviewed journal articles, dissertations or theses, conference papers or proceedings, books, or book chapters. The search identified 3,427 publications. After removal of duplicate results, 2,800 unique publications remained to be screened.

Screening of quantitative search results

We first screened the search results for quantitative survey research using Rayyan Software (Ouzzani et al.,

2016). Abstracts and full texts were screened against several inclusion criteria. First, the analysis needed to have employed either original survey research or secondary analysis of a survey data set. Second, the mean age range of adolescents assessed needed to be between 10 and 17 years. Third, parental monitoring of, involvement in, and/or support of adolescent technology use needed to be examined; however, we did not include research focused solely on television viewing. Fourth, the research's focus needed to be on monitoring of adolescent technology behavior and not on parental use of digital technology to monitor offline behavior (e.g., using GPS tracking on a phone to monitor a child's whereabouts). Finally, the survey items in question needed to have assessed recent behaviors and not, for example, retrospection to the time of adolescence among adults.

All four authors double-blind screened an initial sample of 100 search results for inclusion/exclusion using the above criteria; results were then compared, and discrepancies were resolved by discussion. Subsequently, the remaining search results were double-blind screened for inclusion/exclusion by a subset of the authors (K. L. Modecki, R. E. Goldberg, A. Orben) using the same criteria. Coders agreed on 97% of publications. Disagreements were resolved through group discussion. The screening process yielded 157 publications for inclusion. Closer scrutiny later revealed that 12 publications did not meet the inclusion criteria (e.g., were focused exclusively on television viewing). Thus, the final sample for analysis comprised 145 publications. The search and screening process are summarized in a PRISMA flow diagram in Figure S1 in the Supplemental Material.

Quantitative data extraction and coding

Our data-extraction and coding process for the quantitative survey research was two-pronged. In the first stage, we recorded a host of details about each study (e.g., sample size, country, parent and/or adolescent respondent). In addition, we extracted from each study the quantitative survey items used to measure digital parenting. In the second stage, we assigned substantive codes to each of the extracted survey items. Two authors (A. Orben and R. E. Goldberg) jointly developed a set of 10 substantive codes after they closely read all of the extracted items. Definitions of each code are provided in Table 1. The two authors double-blind coded each survey item using the list of codes and distinguished between parent- and adolescent-reported items. Interrater reliability was strong; Cohen's κ was 91% for parent-reported items and 82% for adolescent-reported items. Discrepancies were resolved through discussion.

Table 1. Table Detailing the Codes Extracted From Quantitative Survey Items by the Study Team, Including the Code, Its Definition, and an Example From the Survey Items Reviewed

Code	Definition	Example ^a
Basic rule setting	Specifying general rules for technology use, including the amount of time that can be spent and when and where technology can be accessed. This also includes basic rules about supervision (e.g., needing to tell a parent when going online).	“I limit the time my child is allowed on the internet (e.g., only 1 hr a day).”
Content-specific rule setting	Specifying rules that limit access to certain technological platforms (e.g., allowing the adolescent to have a social media profile) or access for certain purposes (e.g., to do homework).	“I limit the type of websites my child is allowed to visit.”
Co-use	Active participation in the same technological activity concurrently. This includes items about the parent actively helping the adolescent succeed in a technological task.	“Do shared activities together with your child on the internet.”
Crisis intervention	Helping the adolescent when something goes wrong when using technology.	“Helped him/her . . . when something has bothered him/her on the internet.”
Discussion	Bidirectional communication between the parent and adolescent about technology use.	“I talk with my child about what he/she does on the internet.”
Encouragement	Encouraging the adolescent to use/explore technology, for example to learn new skills or engage in another activity with a positive outcome.	“Encourage your child to explore and learn things on the internet on their own.”
Filtering	Using technological means to control the adolescent’s access to particular platforms or content (e.g., websites or apps) or the time spent on particular devices.	“Do you use filter software or other means of blocking some types of websites?”
Hovering	Not being engaged in the same technological activity as the adolescent but being in the vicinity (e.g., in the same room). References to general supervision without further information about the nature/kind are also classified as hovering.	“Keep an eye on what’s on the screen while your child is online.”
Instruction	Conveying information about technology use from parent to adolescent in an educational manner.	“I show my child how to surf safely on the internet.”
Monitoring	Using technological and nontechnological means to learn what the adolescent is doing online (e.g., checking the adolescent’s Facebook profile or text messages, installing monitoring software). The item must reference a parental-monitoring behavior, not knowledge gleaned by monitoring.	“Do you check which websites your child visited after he/she finishes surfing the internet?”

^aExamples in the table are limited to parent items, although similar items were often asked of adolescents themselves.

Of the 145 publications in the sample, 24 did not contain sufficient detail on the survey items that measured digital parenting to permit coding, and we were not able to procure the items separately; these publications were excluded from the analysis. A further 37 publications provided only examples of relevant survey items, and the full set of items was not procurable; therefore, only the available sample items were used for coding. Thus, we were able to code the complete set of survey items used for 84 publications, and for 37 publications, we coded a partial set.

Results of the quantitative review

The quantitative review highlighted which areas of digital parenting were most often targeted in the interdisciplinary survey-based studies reviewed and which

areas were often overlooked (see Fig. 1). Rules about the time, place, or length of time digital technologies can be used by adolescents (“basic rules”) and also the content they are allowed to consume on these digital technologies (“content rules”) were by far the most popular areas of digital parenting to measure, both when children and their parents were asked. Least popular were items about helping children when they had experienced something distressing online (“crisis”) or encouraging their digital-technology use for positive means (“encouragement”).

When we examined what digital technologies were targeted by the survey items, we also observed a clear skew. Most of the items asked parents and children generally about their use of the “internet” (268 items) or used the word “online” (129 items). Substantially fewer items probed social-media use (43 items) or gaming

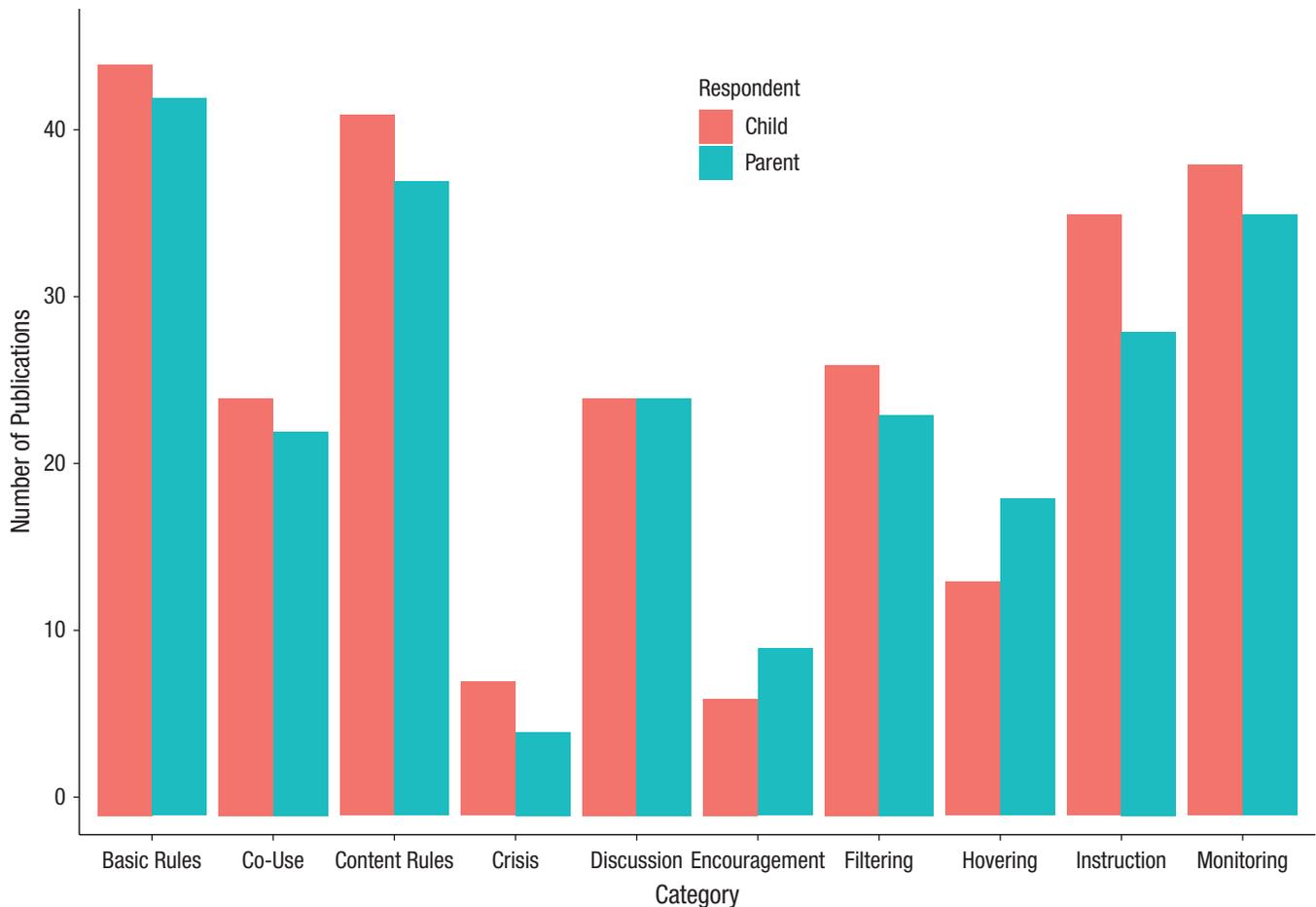


Fig. 1. Bar chart that characterizes the number of outputs with survey items that pertain to certain categories/codes of digital parenting. The categories include basic rules about when, where, and how long technologies can be used (“basic rules”); parents co-using technology with their children (“co-use”); rules about what content or platforms children are allowed to access (“content rules”); helping children if they have a crisis on digital technologies (“crisis”); discussing the use of digital technologies with their child (“discussion”); the encouragement of digital-technology use for positive means (“encouragement”); the use of technological aids to block or filter certain types of digital content (“filtering”); remaining in the vicinity of a child on digital devices (“hovering”); instructing children how to use digital technologies and providing children with information (“instruction”); and monitoring children’s use of digital technologies through either direct or technological means (“monitoring”).

specifically (70 items). Most quantitative measures therefore focused predominantly on general uses of the Internet and digital technologies that afford adolescents to go online and the setting of rules about how they are allowed to use these broad categories of technologies.

When we looked more closely at the measures themselves, we found that the largest proportion are focused on restrictions, specifically, the prevention of spending too much time online or of exposure to certain platforms or materials. Some of the most popular items asked parents about time-based restrictions: whether they allowed their child to use digital technologies only at specific days and/or times (e.g., “I only allow my child to surf the internet at specific days and times,” “I set limits around the time my teen spends on digital technologies”). Some studies also included items on

location-based restrictions (e.g., “I make sure my child uses technology in a public space at home”). Furthermore, many asked about whether, when youths used digital technologies, there were rules about what the adolescents were allowed to engage in (e.g., “I stop my child when he/she visits a less suitable website,” “Set rules about interacting with strangers or which websites can be visited”).

Less restriction-focused items still largely targeted risk prevention. For example, in the “instruction” category, some of the most popular items centered on safety or protection (e.g., “Do your parents suggest to you ways to use the internet safely,” “Explaining why some websites are good/bad”). Moreover, many parental-monitoring items tended to focus on independently gathering information about children’s activities and

social networks rather than soliciting or encouraging children's self-disclosure (e.g., "tracking his/her Facebook page or checking his/her search history," "check[ing] the contents of your child's cell phone," or even "installing software to . . . monitor children's online activity").

Fewer survey items considered positive uses of technology, adolescent self-disclosure, or digital skill building. Yet there were some that did. For example, a relatively small number of studies included items about adolescent self-disclosure of online activity (e.g., "How often do you discuss what you are doing online with your parents?"). Others asked about encouragement of independent exploration on the Internet (e.g., "Encourage your child to explore and learn things on the internet on their own").

Review of Qualitative Studies of Digital Parenting

To identify what aspects of digital parenting have been underrepresented or overemphasized in survey research to date, we complemented our systematic review of the survey literature with a secondary systematic examination of results from qualitative research. This parallel characterization of qualitative accounts allowed us to highlight important gaps and opportunities for psychological research on parenting in the digital age. Thus, a key contribution of our review is not only bridging the multidisciplinary fields of psychology, sociology, communication, and human-computer interaction but also bridging the methodological divide between the quantitative and qualitative literature in these fields.

Identification of literature and screening of search results

We made use of the same systematic search results as the quantitative review to survey the qualitative research (2,800 unique items). The four authors screened abstracts and full texts against similar inclusion criteria. However, we screened only for studies that used focus groups, interviews, and/or open-ended responses. All four authors blindly screened an initial 100 search results to test the inclusion criteria; results were compared, and discrepancies were resolved by discussion. Subsequently, the remaining 2,700 search results were each double-blind screened for inclusion/exclusion by all four authors. The screening process yielded 63 potential publications for inclusion. Closer scrutiny revealed that 14 publications did not include appropriate data (e.g., reported a mixed-method approach but discussed findings only from quantitative results). Thus,

49 publications constituted the final sample. For the search and screening process summarized via a PRISMA diagram, see Figure S2 in the Supplemental Material.

Qualitative coding

In the first stage of coding, K. L. Modecki and P. Wisniewski developed an original coding schema to be used when we coded the 49 studies. In a second stage, the schemas were subsequently developed and modified inductively through close readings of each publication. If a publication demonstrated a given theme, an illustrative quote was selected. Thus, for each publication, we applied pertinent codes and extracted a representative quote for each code identified. The definitions and frequencies of each coded theme are presented in Section 2 in the Supplemental Material.

Results of the qualitative review

Six broad themes emerged from the review of the qualitative literature: (a) restriction and rule setting, (b) parental monitoring, (c) parental communication and support (mediation), (d) parent-teen boundary negotiation, (e) social ecologies of support, and (f) appreciation of technology. We begin below with the concepts that most resembled those in the survey items and note departures from the focus of surveys throughout. Subsequently, we detail concepts that were absent entirely from the survey literature but that we deemed worthy of consideration in future survey research on digital parenting. In particular, the latter two themes (social ecologies of support and appreciation of technology) appeared to be especially prevalent among ethnic-minority and lower SES families and hence need to be areas of emphasis moving forward.

Themes found in both the qualitative and quantitative literature

Restriction and rule setting. In the qualitative literature, restriction and rule setting encapsulated basic house rules such as "There's no taking pictures of yourself and sending it unless it's like you have clothes on, there shouldn't be pictures, nothing like that, sexting, none of that" (Fletcher & Blair, 2016, p. 247). Restriction and rule setting also included a variety of methods for restricting technology use, including using technology to lock down features or set time limits or physically taking away devices during key times. For example, one parent indicated, "During homework, I don't want his phone nearby to distract him. So we had real strict rules last year . . . he would have to charge it every night like outside of his

room" (Solecki, 2016, p. 55). Parents also acknowledged access to technology as leverage in the household, used to "reward" adolescents for completion of their chores and responsibilities or removed as a "punishment" for failure to fulfill obligations:

I will reward them with the cell phone when they are doing the right thing. I think the phone has a lot of power. The parents have more power over their kids than they think, you know? We're holding the money and we're holding the phone. (Solecki, 2016, p. 59)

Indeed, financial support for devices or monthly fees was commonly used as justification for policing adolescents' use and behavior, as this parent went on to share: "Mom pays for it so Mom gets total access to the phone. Mom also takes it away if she feels it needs to be taken away" (Solecki, 2016, p. 59). Also touching on the idea that alternative obligations and activities can help set boundaries on technology use, parents described keeping their children busy with an array of nontechnology activities (e.g., sports) or hobbies (e.g., music) so that they would have limited bandwidth for reactionary use of technologies. This "time balancing" approach, as explained by one parent, meant "always look(ing) for activities, even Saturdays, Sunday, we're always in the street" (Gomez, 2017, p. 114).

Restriction and rule setting also involved attending to the quality of peers' behavior and their potential for negative influence. For example, in a departure from what was covered in the quantitative items, restriction sometimes encompassed tracking adolescents' peers via technology, not only to monitor them but also to decide with whom they are allowed to spend time. Parents and adolescents both described using peers' unsupervised use of technology or their behavior online as a litmus test for restrictions on time together:

When somebody posts to her Facebook, then I'll go into their profile and I'll start to look at those people. And I look at their photo albums. I see if their parents are in with them. I look at their interests and their schooling or whatever that's on that. (Erikson, 2016, p. 1391)

Parental monitoring. Also prevalent in the qualitative literature, as in the survey items, was the umbrella concept of parental monitoring. This included parents actively monitoring adolescents on an ongoing basis by friending them on social media or social media "stalking" so that adolescents' profiles (or at least those profiles known to parents) were under near-constant supervision. Not surprisingly, adolescents described frustration with

this level of scrutiny. One commented, "Your parents are always checking on you, and if you say something bad, you get in trouble. With me . . . if I posted at midnight, my mom would be like 'You should have been in bed. It's a school night!'" (Rickman, 2013, p. 219). Monitoring also included use of parental control apps or other technologies for surveillance. For example, one parent stated, "I can easily just turn my phone on and check what's going on on the laptop. We have them synchronized like that" (Vongkulluksn, 2016, p. 88).

More commonly, however, parental monitoring was characterized as "intermittent." Parents gained access to devices sporadically, either requiring access on demand or secretly gaining access to review children's activities. As one adolescent described, intermittent access was still experienced as invasive:

She thinks she slick . . . so she'll come in and she'll be pretending like she's wiping something off or getting something up and I'll be like okay, and I'll be scrolling down and she'll be like, "Who is that?" and asking me questions. (Fletcher & Blair, 2016, p. 249)

Parental communication and support. Parental communication and support (mediation) was a theme more prevalent in the qualitative literature than in the survey items. This largely reflected the roots of the qualitative research in communication and media studies and was primarily grounded in parents' positive and open communication regarding youths' technology use. For example, one parent likened the online space to a potentially risky area that needs to be scaffolded: "You wouldn't take a kid to a pool and say, 'Don't go swimming, you might drown.' You're gonna take them to the pool, and you're gonna teach them ways to be safe around water" (Mendoza, 2013, p. 137).

Often, parents spoke of giving youths broad guidelines in which to operate to stay actively involved in their child's online life and encourage self-disclosure. For example, a parent said:

It's still a trust game, and she's really a pretty good kid. She does have one e-mail account she uses with friends. I don't have the password for that. I really struggled with it for a while, but then I decided I could be a superprotective parent. She should know how to be responsible to gain more independence. (Hopper-Losenicky, 2010, p. 64)

Likewise, parents encouraged self-disclosure and indicated that warmth and openness in their relationship allowed for adolescents to share emerging issues: "It is important to talk. If they know that they can come to

you in case of a problem, I find that important” (Symons et al., 2017, p. 428). That said, parents also described constant calibrations and challenges balancing a desire to monitor youths with desires to trust the child and respect their privacy. For instance, one noted, “I feel like he’s old enough that I have to give him privacy. And I don’t want to be breathing down his neck all the time because I don’t want to alienate him” (Erickson et al., 2016, p. 1392).

This theme also involved encouraging and teaching children to be “decent” individuals via digital citizenship. As one parent pointed out, this included basic standards of communication: “What I don’t dare to say in someone’s face, I also won’t write it down. It’s a kind of respect that you need to have I think, also in that medium” (Symonds, 2017, p. 426). Also reflecting the theoretical grounding of media studies in Bandura’s social-learning theory (Clark, 2011), this concept included parenting by example. That is, by parents modeling healthy technology use and limit setting, children will themselves learn healthy use. For example, one parent commented, “We’ve also had conversations where the kids have told us we’re using our devices too much. We appreciate having it pointed out, because you’re right. It’s not a good example” (Blackwell et al., 2016, p. 1395).

Themes found mainly in the qualitative literature

Our parallel qualitative review also allowed us to characterize prevalent themes that emerged from interviews with parents and adolescents that are not yet covered in current quantitative survey research on parenting of adolescent technology use. We focus on three broad themes that illustrate deficits in the ways digital parenting has been assessed, including parent–teen boundary negotiations, social ecologies of support, and alternate perspectives on technology.

Parent–teen boundary negotiations. First, parent–teen boundary negotiations were often described by both parents and adolescents. These included tensions around parental rules and restrictions on technology use and how these rules and restrictions were renegotiated and/or circumvented. Parents described a regular back and forth over rules and a concern that strict rules would backfire: “When I try to keep my child within the boundary of rules, he would start to lie” (Rhim et al., 2016, p. 104). Adolescents, in turn, expressed frustration with rubbing up against set limits and described instances of feeling under the microscope: “Here’s my iPhone, there’s you [their parent]. I’m looking at Twitter, you’re looking at me on my phone looking at Twitter” (Blackwell et al., 2016,

p. 1397). Unsurprisingly, then, adolescents also described workarounds, in which face-value rules (e.g., no texting peers) were circumvented via another technology (e.g., using social media chats). As described by one adolescent, moving platforms can provide a reprieve from constant parental scrutiny:

Twitter is like . . . [pause] when your parents leave the house and you can have a party. And you do and say what you want. But Facebook is like when mom and dad are home. You have to like, watch yourself. (Rickman, 2013, p. 222)

Social ecologies of support. Second, the social ecologies of support concept broadly encompassed attention to adolescents’ development in nested contexts and more specifically spoke to the significance of family members, friends, and school systems in enforcing and sometimes establishing digital rules. At the inner most ecology, parents described enlisting extended family to look out for children on social media and the role of older siblings in helping to monitor technology use at home and provide parents with a sense of their sibling’s digital identity. This reliance on extended families was especially prevalent among low-SES and racial-minority individuals. For example, describing the role of siblings among Puerto Rican and Dominican families living in the United States, a parent noted:

The big one is always checking, cause like the other one is younger and that, she is more attentive, closer to the little one, because we are in a ladder [laughs] us with the big one and the big one checks what the little one does. (Gomez, 2017, p. 151)

Wider ecologies also included the role of schools in setting restrictions on youths’ access to certain sites, but also the difficulties that ensue when schools’ mandates of technology use run counter to parents’ technology limits or approaches. For instance, one parent shared that one “worry of [her son] being online is that the schools aren’t necessarily training kids the way I’m training my kids at home” (Mendoza, 2013, p. 180). During the COVID-19 pandemic, such tensions between parental restrictions and the necessities of technology for school were undoubtedly amplified, and quantifying these tensions in ongoing research will be important.

Appreciation of technology. Finally, the appreciation of technology concept largely encompassed parents’ understanding of technology’s positive potential with respect to social skill building and as a future gateway for career opportunities. For instance, parents described promoting

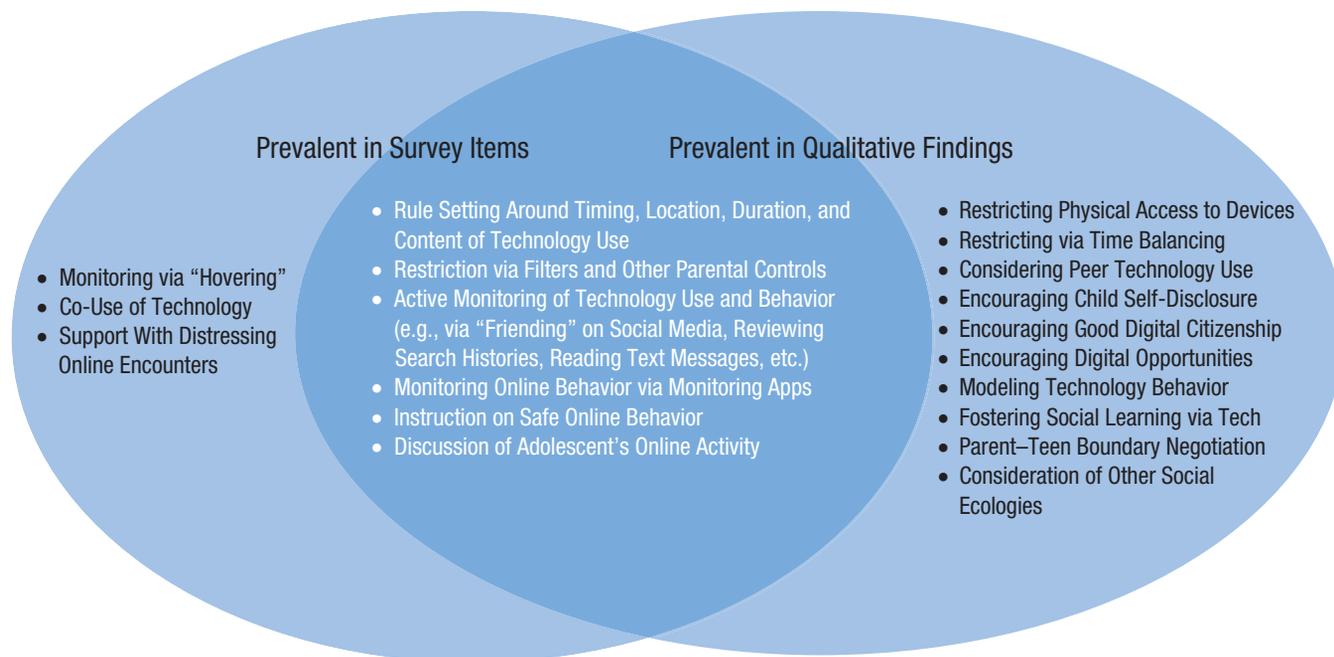


Fig. 2. Venn diagram of concepts prevalent primarily in (left) survey items, (right) qualitative findings, and (middle) both.

their offspring’s technology use to encourage sociability and communication skills. Parents acknowledged, “this is how they communicate with each other, and I need to get on board and catch up” (Ebersole, 2012). Technology was also described as a pathway to future success. Here, technology was viewed largely as an opportunity, for instance, “an outlet—as he (the child) . . . gets interested in writing, or in design, or in photography, or whatever it is. It will give you a kind of gallery, a place to exhibit” (Mendoza, 2013, p. 207). By the same token, lack of access to technology was sometimes described as a looming disadvantage among families with less access; parents expressed concerns that disparities in online skills might engender disparities in future career prospects. Adolescents from low-income families described challenges such as printing homework and relying on libraries for digital assignments. Even in classrooms, lack of devices posed a challenge, as described by one adolescent:

My theology teacher was like, okay, take your phones out, and we did a live Quizlet . . . so everyone went in their phones, signed in, whatever and they picked. . . . Yeah, so, that means I had to tell the teacher I can’t get in. (Gomez, 2017, p. 170)

Discussion

Concerns about new digital technologies and their potential harm for children have been the subject of

considerable societal debate (George & Odgers, 2015). Amid mixed findings regarding the impact of technology use on adolescents’ well-being (Orben & Przybylski, 2019b; Twenge et al., 2018), parents are left on their own to balance the competing demands of addressing safety concerns and fostering adolescents’ autonomy. To address the challenges of modern parenting, researchers have been seeking new ways to measure digital parenting. However, these efforts have largely been ad hoc.

The current study’s rigorous stocktaking through two interdisciplinary systematic reviews yielded a comprehensive overview of both quantitative measurement and direct qualitative accounts of adolescents and their parents. Merging insights from both literatures allowed us to depict the realities of digital parenting and identify key gaps in how digital-parenting strategies have been operationalized to date. As depicted in Figure 2, although many concepts appeared in both literatures, a small subset appeared almost exclusively in the quantitative literature (and hence indicate potential overemphasis in current measurement), and a nontrivial number appeared almost exclusively in the qualitative literature (and hence may be currently neglected in quantitative measurement). For example, the qualitative literature highlighted adolescents’ need for autonomy, heterogeneity in families’ ecological systems for support and monitoring, and the many positive affordances of technology, particularly for youths from disadvantaged backgrounds.

Restriction and risk

As characterized in Figure 2, overlaps between the quantitative-survey and qualitative literatures centered especially around themes related to restriction and risk reduction: Both literatures have emphasized restriction via rule setting (on the timing, location, duration, and content of technology use) and restriction via filters or other technology-based controls.

Nonetheless, the qualitative literature provides additional nuance about restriction that should be incorporated into future quantitative work: (a) restriction through physical removal of the child's device, which is most feasible with mobile phones and tablets that can, for example, be placed in drawers, and (b) restriction via distraction or time balancing, for example, keeping children busy with offline extracurricular activities and hobbies so that they lack time for recreational technology use. Note that although removing devices is a readily available strategy for restricting mobile technologies, doing so may effectively cut off adolescents' social support network, which could produce negative consequences (e.g., Leung, 2006). By contrast, time-balancing approaches can arguably facilitate adolescents' exposure to novel contexts and complementary opportunities for identity development and skill building (Modecki et al., 2018; Vernon, 2019). As a result, time-balancing techniques have the potential to both limit technology time and help meet adolescents' developmental mandate for exploration and autonomy (Larson et al., 2002). That said, keeping teenagers "busy" with varied activities and in-person demands tends to require both parental time and financial resources and thus may not be equally accessible to all households. Consequently, the effectiveness of this parenting strategy across diverse family contexts remains unknown and presents an important area for future research.

A final perspective on restriction present only in the qualitative literature was how parents use information on their children's peers' technology use to adjust their rulemaking. For example, parents might use content on a friend's social media profile or their family's rules on digital-technology use to decide whether to permit their child to spend time at the friend's house. Thus, rule setting extends beyond the immediate family bubble and includes oversight of more than just the child's use, which indicates it is a truly multidimensional behavior.

Monitoring

Another area in which the quantitative survey research and, to a lesser extent, the qualitative literature often fell short was in its unidimensional conceptualization

of parental monitoring, which focused almost exclusively on control-based parenting strategies. Although developing a warm and trusting parent-child relationship and providing youths with autonomy support lead to better knowledge regarding adolescents' activities (Crouter et al., 2005), nearly all measures focused on parental control and independent sourcing of adolescents' information. That is, survey items focused on the varied ways parents worked to independently gather information on adolescents' uses of digital technologies: These included "friending" children on social media to track their posts, checking search histories, examining text messages and call logs, and (less commonly) using software to continually monitor online behavior. An important distinction moving forward will be to parse parental monitoring behaviors to better characterize those that might be construed by adolescents as snooping or invasions of privacy. As described earlier, adolescents sometimes interpret unexpected parental snooping, including on-demand inspection of devices, as a violation of their privacy, and there is potential for both increased secrecy and heightened parent-child conflict (Hawk et al., 2008). Future research might investigate whether, for instance, a mutual expectation of regular phone inspection results in fewer negative outcomes.

Relatedly, relatively few items measured how parents encourage self-disclosure from their children. This opposes decades of research that points to the benefits of positive relationship strategies for promoting adolescent safety (Kerr & Stattin, 2000; Tokić & Pećnik, 2011) and shows that adolescents' independent self-disclosure is most effective at facilitating parental knowledge of adolescents' whereabouts, activities, and well-being (Hunter et al., 2011). As a result, there is significant potential for reconceptualizations of digital parenting that incorporate basic tenets of parenting that preceded the rise of digital technologies to ensure adequate representation of positive parenting strategies.

Positive uses

An emphasis on risk prevention prevailed in the survey research even among items that were less restriction focused. For example, survey items that considered instruction and support often focused on whether parents teach their children to use the Internet safely or support them when they encounter something distressing online. Yet parents in focus groups and interviews often focused on benefits of technology. This was especially prevalent among low-SES families who were highly cognizant of the ways in which their adolescent was potentially missing out on current and future opportunities. More broadly, positive themes that

emerged specifically in the qualitative review included discussions of good digital citizenship, identification and encouragement of digital opportunities, and parent role modeling of positive technology use.

The global idea of “being a good person” and how this translates to the online space was described by parents as an underlying tenet that they applied across their interactions with teens. This goal reflects the primary responsibility of parents of adolescents, to assist with a transition to independent young adulthood, having inculcated youths with a prosocial identity and value system (Allen et al., 1996). One could argue that the goal of good digital citizenship reflects postdigital parenting, in which adolescents’ values, character, and identity are reflected as much online as offline.

Also critical for postdigital parenting is the recognition of prospects provided by new technologies and, accordingly, identification and encouragement of digital opportunities for adolescents. Parents discerned prospects for professional skills and career pathways using digital technologies and potential for academic and social learning in a world in which virtual learning and communication are increasingly the norm. Yet there was minimal evidence of such possibilities in survey parenting measures. Forward-facing future digital-parenting studies should weave in positive expectations associated with technology, such as enhanced educational opportunities and a wider breadth of career possibilities, to accurately reflect parental perspectives and goals. Among families with restricted access to new and emerging technologies, it will be especially important to adequately capture parents’ expectations and hopes related to future digital opportunities.

Outdated items

There were several areas in which a lack of qualitative evidence indicated aspects of parenting that are not as relevant to the current digital environment as they may have been in the past. For example, hovering emerged much less frequently in qualitative accounts than in quantitative research. This suggests that such a parenting strategy may be less feasible or useful in the era of personal mobile devices. The common inclusion of hovering items in surveys likely harkens back to measures based on nonmobile and large-screened technologies such as desktop computers or televisions, which could be casually monitored from a distance. Given that handheld devices with small screens are increasingly prevalent, quantitative measurement is arguably ripe for an update.

A further example is parent–child social co-use of technology (i.e., using the same device at the same time), a pillar of Valkenburg et al.’s (1999) seminal parental-mediation strategies for television viewing. It

was relatively absent in the qualitative findings, which suggests that, like hovering, it may be less relevant today, in the age of personal digital devices. Although co-use may still be an appropriate parenting strategy for technologies such as television and video games, the premise of sharing time together to enhance adolescents’ digital experiences on personal digital devices is less clear-cut. That said, co-use need not be entirely lost or irrelevant; at its core, this concept reflects an effort to grow and maintain a positive relationship with adolescents. Its benefits traditionally rested in spending time together and being present positively in adolescents’ lives, which is undoubtedly still important for parenting in the age of the smartphone.

The way forward

Parenting adolescents has long been a complex task, balancing adolescents’ need for independence and exploration with appropriate scaffolding and safeguards as they move toward young adulthood. Current research that investigated parenting in the digital age has largely focused on the latter, which reinforces a danger-focused lens that emphasizes avoidance of technology-related risks. This “spotlighting” on risk not only limits scholarly dialogue on affordances and benefits but also reduces a multidimensional and complex set of parenting behaviors into a single dimension that poorly captures the realities of digital parenting. Hence, not only are researchers provided with a one-sided take on digital parenting, but also the complex interactions between communicating trust and providing digital opportunities and support to adolescents, alongside restrictions and monitoring to avoid harm, are not usefully reflected.

Further adding to the complexity of digital parenting is the nature of parent-adolescent relationships, which are characterized by bidirectional influence and two-way communication, including adolescent self-disclosure (Smetana et al., 2005). Survey items, however, often assume unidirectionality from parents to teens. Moreover, adolescents’ behavioral responses to parent rule setting are rarely considered, such as technological workarounds (e.g., moving to social media chat when texting privileges are removed and keeping alternative social media profiles secret from parents). Yet these behaviors tell as much about the effectiveness of digital-parenting strategies as they do about parental knowledge. Likewise, adolescent development necessarily brings with it some degree of parent–child–conflict, as both teens and parents negotiate a level of separation (Allen et al., 1996). Boundary conflicts in which parents set technology rules and recalibrate these rules according to adolescents’ pushback or negotiation are reflective of this normative developmental process and need to be mirrored in the fields’ measurement.

Among the most striking area of neglect in digital-parenting scholarship has been the failure to illustrate and address the different demands made of parents across heterogeneous contexts (Huang et al., 2018; Modecki et al., 2020). As a result, the most pressing call to action for digital-parent scholars is the need to account for differences in digital-parenting norms, values, and behaviors by SES and race/ethnicity. For example, parents that lived in lower income settings made clear in their interviews and focus groups that technology can be a safeguard that keeps adolescents connected and entertained indoors when neighborhoods are unsafe (Gomez, 2017). In addition, parents and adolescents both considered technology a pathway to privilege because adolescents will need digital skills to engage in a modern professional landscape. Thus, more—not less—technology engagement may be part of many parental agendas.

Finally, the qualitative literature underscored the need to consider the role of grandparents, siblings, and other extended family members in the caregiving orb. This theme emerged most frequently in interviews with non-White and/or lower SES parents but almost certainly applies to a broad range of families. Indeed, parents often rely on a network of individuals—whether family, friends, and/or schools—to monitor and support their adolescents online. Parents may sometimes use such individuals as proxies, and the ways that extended networks maintain knowledge of adolescents' outward facing identity and behavior is a compelling question worthy of future investigation.

Conclusion

Parental concerns about adolescents' use of technology have been likened to generational concerns that have plagued parents across time, from telephones to television to video games (Wartella & Jennings, 2000). When it comes to mobile digital technologies, these concerns are only amplified, given their personal use and immersive nature (Orben, 2020a). But underpinning such worries is the eternal parental tension between protecting adolescents' safety and nurturing their autonomy. Alongside potential risks of technologies such as smartphones exist real affordances for connection, creative exploration, academic success, and career opportunities (Modecki, Duvenage, et al., 2022). Although past digital-parenting measurement has zeroed in on concerns regarding looming risks, largely neglected has been the nature of adolescent development and the many advantages new technologies provide.

To better characterize the state of the field and provide direction for future measurement and study, we undertook two interdisciplinary systematic reviews of digital-parenting measurement and experience.

Examining both quantitative and qualitative literatures, we found that this approach provided a needed bridge to narrow the chasm between understanding how parenting of adolescents appears “on the ground” and how researchers have characterized parental monitoring and support in the postdigital age. Decades of developmental research have shown that parents can meet youths' developmental needs by providing safeguards while simultaneously allowing for a process of emotional and physical separation (Allen et al., 1996). The online space is no different, and our interpretation of the research landscape highlights important oversights and opportunities for novel, pressing multidisciplinary research on digital parenting.

Transparency

Action Editor: Laura A. King

Editor: Laura A. King

Declaration of Conflicting Interests

The author(s) declared that there were no conflicts of interest with respect to the authorship or the publication of this article.

Funding

This work was supported by Society for Research in Child Development and Jacobs Foundation.

ORCID iD

Kathryn L. Modecki  <https://orcid.org/0000-0002-9937-9748>

References

- Allcott, H., Braghieri, L., Eichmeyer, S., & Gentzkow, M. (2020). The welfare effects of social media. *American Economic Review*, 110(3), 629–676.
- Allen, J. P., Hauser, S. T., O'Connor, T. G., Bell, K. L., & Eickholt, C. (1996). The connection of observed hostile family conflict to adolescents' developing autonomy and relatedness with parents. *Development and Psychopathology*, 8(2), 425–442.
- Anderson, M., & Jiang, J. (2018, May 31). *Teens, social media & technology 2018*. Pew Research Center. <https://www.pewresearch.org/internet/2018/05/31/teens-social-media-technology-2018/>
- Anderson, M., & Perrin, A. (2018, October 26). *Nearly one-in-five teens can't always finish their homework because of the digital divide*. Pew Research Center. <https://www.pewresearch.org/fact-tank/2018/10/26/nearly-one-in-five-teens-cant-always-finish-their-homework-because-of-the-digital-divide/>
- Auxier, B., Anderson, M., Perrin, A., & Turner, E. (2020, August 8). *Parenting children in the age of screens*. Pew Research Center. <https://www.pewresearch.org/internet/2020/07/28/parenting-children-in-the-age-of-screens/>
- Badillo-Urquiola, K., Page, X., & Wisniewski, P. (2019). Risk vs. restriction: The tension between providing a sense of normalcy and keeping foster teens safe online. In *CHI '19: Proceedings of the 2019 CHI Conference on Human*

- Factors in Computing Systems*. Association for Computing Machinery. <https://doi.org/10.1145/3290605.3300497>
- Bandura, A. (1978). Social learning theory of aggression. *Journal of Communication*, 28(3), 12–29.
- Bell, V., Bishop, D. V., & Przybylski, A. K. (2015). The debate over digital technology and young people. *The BMJ*, 351, Article h3064. <https://doi.org/10.1136/bmj.h3064>
- Beyens, I., Pouwels, J. L., van Driel, I. I., Keijsers, L., & Valkenburg, P. M. (2020). The effect of social media on well-being differs from adolescent to adolescent. *Scientific Reports*, 10(1), 1–11.
- Blackwell, L., Gardiner, E., & Schoenebeck, S. (2016). Managing expectations: Technology tensions among parents and teens. In *CSCW '16: Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing* (pp. 1390–1401). Association for Computing Machinery. <https://doi.org/10.1145/2818048.2819928>
- Chassiakos, Y. L. R., Radesky, J., Christakis, D., Moreno, M. A., & Cross, C. (2016). Children and adolescents and digital media. *Pediatrics*, 138(5), Article e20162593. <https://doi.org/10.1542/peds.2016-2593>
- Chen, L., & Shi, J. (2019). Reducing harm from media: A meta-analysis of parental mediation. *Journalism & Mass Communication Quarterly*, 96(1), 173–193. <https://doi.org/10.1177/1077699018754908>
- Clark, L. S. (2011). Parental mediation theory for the digital age. *Communication Theory*, 21(4), 323–343.
- Collins, W. A., Laursen, B., Mortensen, N., Luebker, C., & Ferreira, M. (1997). Conflict processes and transitions in parent and peer relationships: Implications for autonomy and regulation. *Journal of Adolescent Research*, 12(2), 178–198.
- Courtois, C., & Nelissen, S. (2018). Family television viewing and its alternatives: Associations with closeness within and between generations. *Journal of Broadcasting & Electronic Media*, 62(4), 673–691.
- Crouter, A. C., Bumpus, M. F., Davis, K. D., & McHale, S. M. (2005). How do parents learn about adolescents' experiences? Implications for parental knowledge and adolescent risky behavior. *Child Development*, 76(4), 869–882.
- Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268.
- Eastin, M. S., Greenberg, B. S., & Hofschire, L. (2006). Parenting the Internet. *Journal of Communication*, 56(3), 486–504. <https://doi.org/10.1111/j.1460-2466.2006.00297.x>
- Ebersole, D. S. (2012). “There is no manual to this mess”: *Parent-adolescent communication patterns, privacy management, and talks about substance use*. The Pennsylvania State University.
- Ellison, T. L., & Solomon, M. (2019). Counter-storytelling vs. deficit thinking around African American children and families, digital literacies, race, and the digital divide. *Research in the Teaching of English*, 53(3), 223–244.
- Erickson, L., Wisniewski, P., Xu, H., Carroll, J. M., Rosson, M. B., & Perkins, D. F. (2016). The boundaries between: Parental involvement in a teen's online world. *Journal of the Association for Information Science and Technology*, 67(6), 1384–1403. <https://doi.org/10.1002/asi.23450>
- Flake, J. K., Pek, J., & Hehman, E. (2017). Construct validation in social and personality research: Current practice and recommendations. *Social Psychological and Personality Science*, 8(4), 370–378.
- Fletcher, A. C., & Blair, B. L. (2016). Implications of the family expert role for parental rules regarding adolescent use of social technologies. *New Media & Society*, 18(2), 239–256.
- Garg, R., & Sengupta, S. (2020). He is just like me: A study of the long-term use of smart speakers by parents and children. *Proceedings of the ACM on Interactive, Mobile, Wearable and Ubiquitous Technologies*, 4(1), Article 11. <https://doi.org/10.1145/3381002>
- George, M. J., & Odgers, C. L. (2015). Seven fears and the science of how mobile technologies may be influencing adolescents in the digital age. *Perspectives on Psychological Science*, 10(6), 832–851. <https://doi.org/10.1177%2F1745691615596788>
- Gomez, S. E. (2017). *Information practices relative to parental mediation and the family context among Puerto Rican and Dominican teens* [Doctoral dissertation, Rutgers, The State University of New Jersey]. <https://rucore.libraries.rutgers.edu/rutgers-lib/55483/>
- Hamilton, J. L., Nesi, J., & Choukas-Bradley, S. (2020). *Teens and social media during the COVID-19 pandemic: Staying socially connected while physically distant*. PsyArXiv. <https://doi.org/10.31234/osf.io/5stx4>
- Hankerson, D., Marshall, A. R., Booker, J., El Mimouni, H., Walker, I., & Rode, J. A. (2016). Does technology have race? In *CHI EA '16: Proceedings of the 2016 CHI Conference Extended Abstracts on Human Factors in Computing Systems* (pp. 473–486). Association for Computing Machinery. <https://doi.org/10.1145/2851581.2892578>
- Harpin, S., Davis, J., Low, H., & Gilroy, C. (2016). Mobile phone and social media use of homeless youth in Denver, Colorado. *Journal of Community Health Nursing*, 33(2), 90–97. <https://doi.org/10.1080/07370016.2016.1159440>
- Hawk, S. T., Hale, W. W., III, Raaijmakers, Q. A., & Meeus, W. (2008). Adolescents' perceptions of privacy invasion in reaction to parental solicitation and control. *The Journal of Early Adolescence*, 28(4), 583–608.
- Hawk, S. T., Keijsers, L., Frijns, T., Hale, W. W., III, Branje, S., & Meeus, W. (2013). “I still haven't found what I'm looking for”: Parental privacy invasion predicts reduced parental knowledge. *Developmental Psychology*, 49(7), 1286–1298. <https://doi.org/10.1037/a0029484>
- Heffer, T., Good, M., Daly, O., MacDonell, E., & Willoughby, T. (2019). The longitudinal association between social-media use and depressive symptoms among adolescents and young adults: An empirical reply to Twenge et al. (2018). *Clinical Psychological Science*, 7(3), 462–470. <https://doi.org/10.1177%2F2167702618812727>
- Huang, G., Li, X., Chen, W., & Straubhaar, J. D. (2018). Fall-behind parents? The influential factors on digital parenting self-efficacy in disadvantaged communities. *American Behavioral Scientist*, 62(9), 1186–1206.
- Hunter, S. B., Barber, B. K., Olsen, J. A., McNeely, C. A., & Bose, K. (2011). Adolescents' self-disclosure to parents across cultures: Who discloses and why. *Journal of Adolescent Research*, 26(4), 447–478.

- Jago, R., Edwards, M. J., Urbanski, C. R., & Sebire, S. J. (2013). General and specific approaches to media parenting: A systematic review of current measures, associations with screen-viewing, and measurement implications. *Childhood Obesity, 9*, S51–S72. <https://doi.org/10.1089/chi.2013.0031>
- Jensen, M., George, M. J., Russell, M. R., & Odgers, C. L. (2019). Young adolescents' digital technology use and mental health symptoms: Little evidence of longitudinal or daily linkages. *Clinical Psychological Science, 7*(6), 1416–1433. <https://doi.org/10.1177/2167702619859336>
- Jones, L. M., & Mitchell, K. J. (2016). Defining and measuring youth digital citizenship. *New Media & Society, 18*(9), 2063–2079.
- Jones, L. M., Mitchell, K. J., & Finkelhor, D. (2013). Online harassment in context: Trends from three youth internet safety surveys (2000, 2005, 2010). *Psychology of Violence, 3*(1), 53–69. <https://doi.org/10.1037/a0030309>
- Kardefelt-Winther, D. (2014). A conceptual and methodological critique of internet addiction research: Towards a model of compensatory internet use. *Computers in Human Behavior, 31*, 351–354.
- Kerr, M., & Stattin, H. (2000). What parents know, how they know it, and several forms of adolescent adjustment: Further support for a reinterpretation of monitoring. *Developmental Psychology, 36*(3), 366–380.
- Klein, R. (2018, February 7). Limiting your child's fire time: A guide for concerned paleolithic parents. *The New Yorker*. <https://www.newyorker.com/humor/daily-shouts/limiting-your-childs-fire-time-a-guide-for-concerned-paleolithic-parents>
- Koning, I. M., Peeters, M., Finkenauer, C., & van den Eijnden, R. (2018). Bidirectional effects of Internet-specific parenting practices and compulsive social media and Internet game use. *Journal of Behavioral Addictions, 7*(3), 624–632.
- Kreski, N., Platt, J., Rutherford, C., Olsson, M., Odgers, C., Schulenberg, J., & Keyes, K. M. (2021). Social media use and depressive symptoms among United States adolescents. *Journal of Adolescent Health, 68*(3), P572–P579. <https://doi.org/10.1016/j.jadohealth.2020.07.006>
- Larson, R. W., Wilson, S., Brown, B. B., Furstenberg, F. F., Jr., & Verma, S. (2002). Changes in adolescents' interpersonal experiences: Are they being prepared for adult relationships in the twenty-first century? *Journal of Research on Adolescence, 12*(1), 31–68.
- Lauricella, A. R., Gingel, D. P., Beaudoin-Ryan, L., Robb, M. B., Saphir, M., & Wartella, E. A. (2016, December 6). *The Common Sense census: Plugged-in parents of tweens and teens*. Common Sense Media. <https://www.common-sense-media.org/sites/default/files/research/report/common-sense-parent-census-whitepaper-new-for-web.pdf>
- Leung, L. (2006). Stressful life events, motives for Internet use, and social support among digital kids. *CyberPsychology & Behavior, 10*(2), 204–214.
- Livingstone, S., Blum-Ross, A., Pavlick, J., & Ólafsson, K. (2018). *In the digital home, how do parents support their children and who supports them?* (Survey report 1). Parenting for a Digital Future. http://eprints.lse.ac.uk/87952/1/Livingstone_Parenting%20Digital%20Survey%20Report%201_Published.pdf
- Livingstone, S., Ólafsson, K., Helsper, E. J., Lupianez-Villanueva, F., Veltri, G. A., & Folkvord, F. (2017). Maximizing opportunities and minimizing risks for children online: The role of digital skills in emerging strategies of parental mediation. *Journal of Communication, 67*(1), 82–105.
- London, R. A., Pastor, M., Jr., Servon, L. J., Rosner, R., & Wallace, A. (2010). The role of community technology centers in promoting youth development. *Youth & Society, 42*(2), 199–228.
- McClure, E. R., Chentsova-Dutton, Y. E., Holochwost, S. J., Parrott, W. G., & Barr, R. (2018). Look at that! Video chat and joint visual attention development among babies and toddlers. *Child Development, 89*(1), 27–36.
- Mendoza, K. (2013). *Protection and empowerment: Exploring parents' use of Internet mediation strategies with preteens* [Doctoral dissertation, Temple University]. <http://hdl.handle.net/20.500.12613/1905>.
- Modecki, K. L., Blomfield Neira, C., & Barber, B. L. (2018). Finding what fits: Breadth of participation at the transition to high school mitigates declines in self-concept. *Developmental Psychology, 54*(10), 1954–1970. <https://doi.org/10.1037/dev0000570>
- Modecki, K. L., Duvenage, M., Uink, B., Barber, B., & Donovan, C. (2022). Adolescents' online coping: When less is more but none is worse. *Clinical Psychological Science, 10*(3), 467–481. <https://doi.org/10.1177/21677026211028983>
- Modecki, K. L., Low-Choy, S., Uink, B. N., Vernon, L., Correia, H., & Andrews, K. (2020). Tuning into the real effect of smartphone use on parenting: A multiverse analysis. *Journal of Child Psychology and Psychiatry, 61*(8), 855–865.
- Modecki, K. L., Low-Choy, S., Vasco, D., Vernon, L., & Uink, B. (2021). Commentary response: Smartphone use and parenting: Re-stratifying the multiverse for families of young children. *Journal of Child Psychology and Psychiatry, 62*(12), 1497–1500. <https://doi.org/10.1111/jcpp.13433>
- Moher, D., Liberati, A., Tetzlaff, J., & Altman, D. G., & Prisma Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: The PRISMA statement. *PLOS Medicine, 6*(7), Article e1000097. <https://doi.org/10.1371/journal.pmed.1000097>
- Moreno, M. A., & Uhls, Y. T. (2019). Applying an affordances approach and a developmental lens to approach adolescent social media use. *Digital Health, 5*, Article 2055207619826678. <https://doi.org/10.1177/2055207619826678>
- Nielsen, P., Favez, N., Liddle, H., & Rigter, H. (2019). Linking parental mediation practices to adolescents' problematic online screen use: A systematic literature review. *Journal of Behavioral Addictions, 8*(4), 649–663. <https://doi.org/10.1556/2006.8.2019.61>
- Nikken, P., & Jansz, J. (2006). Parental mediation of children's videogame playing: A comparison of the reports by parents and children. *Learning, Media and Technology, 31*(2), 181–202.
- Noble, S. U. (2018). *Algorithms of oppression*. New York University Press.
- Odgers, C. L. (2019). Why digital tools have not yet revolutionized adolescent health research and what we can do. *Journal of Research on Adolescence, 29*(3), 675–681.

- Ogden, C. L., & Jensen, M. R. (2020). Annual research review: Adolescent mental health in the digital age: Facts, fears, and future directions. *Journal of Child Psychology and Psychiatry*, *61*(3), 336–348.
- Office of Communications. (2020). *Online Nation 2020 report*. https://www.ofcom.org.uk/__data/assets/pdf_file/0027/196407/online-nation-2020-report.pdf
- Olweus, D. (2012). Cyberbullying: An overrated phenomenon? *European Journal of Developmental Psychology*, *9*(5), 520–538.
- Orben, A. (2020a). The Sisyphean cycle of technology panics. *Perspectives on Psychological Science*, *15*(5), 1143–1157. <https://journals.sagepub.com/doi/full/10.1177/1745691620919372>
- Orben, A. (2020b). Teenagers, screens and social media: A narrative review of reviews and key studies. *Social Psychiatry and Psychiatric Epidemiology*, *55*(4), 407–414.
- Orben, A., & Przybylski, A. K. (2019a). The association between adolescent well-being and digital technology use. *Nature Human Behaviour*, *3*(2), 173–182.
- Orben, A., & Przybylski, A. K. (2019b). Screens, teens, and psychological well-being: Evidence from three time-use-diary studies. *Psychological Science*, *30*(5), 682–696. <https://doi.org/10.1177/0956797619830329>
- Ouzzani, M., Hammady, H., Fedorowicz, Z., & Elmagarmid, A. (2016). Rayyan—a web and mobile app for systematic reviews. *Systematic Reviews*, *5*, Article 210. <https://doi.org/10.1186/s13643-016-0384-4>
- Pater, J. A., Miller, A., & Mynatt, E. D. (2015). This digital life: A neighborhood-based study of adolescents' lives online. In *CHI '15: Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems* (pp. 2305–2314). Association for Computing Machinery. <https://doi.org/10.1145/2702123.2702534>
- Pina, L. R., Gonzalez, C., Nieto, C., Roldan, W., Onofre, E., & Yip, J. C. (2018). How Latino children in the US engage in collaborative online information problem solving with their families. *Proceedings of the ACM on Human-Computer Interaction*, *2*(CSCW), Article 140. <https://doi.org/10.1145/3274409>
- Radesky, J. S., Eisenberg, S., Kistin, C. J., Gross, J., Block, G., Zuckerman, B., & Silverstein, M. (2016). Overstimulated consumers or next-generation learners? Parent tensions about child mobile technology use. *The Annals of Family Medicine*, *14*(6), 503–508.
- Rhim, J., Lee, S., Lee, S., Na, J. W., & Doh, Y. Y. (2016). Mutual rule-shaping with parents to form adolescents' healthy smartphone use. *Annual Review of Cybertherapy and Telemedicine*, *14*, 102–108.
- Rickman, A. N. (2013). *Living docility and dissent: US small town girls' social media use within social marginalization* [Doctoral dissertation, University of Illinois at Urbana-Champaign]. <http://hdl.handle.net/2142/45460>
- Schlesinger, A., Edwards, W. K., & Grinter, R. E. (2017). Intersectional HCI: Engaging identity through gender, race, and class. In *CHI '17: Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems* (pp. 5412–5427). Association for Computing Machinery. <https://doi.org/10.1145/3025453.3025766>
- Smetana, J. G., Crean, H. F., & Campione-Barr, N. (2005). Adolescents' and parents' changing conceptions of parental authority. *New Directions for Child and Adolescent Development*, *2005*(108), 31–46.
- Smetana, J. G., Metzger, A., Gettman, D. C., & Campione-Barr, N. (2006). Disclosure and secrecy in adolescent–parent relationships. *Child Development*, *77*(1), 201–217.
- Soenens, B., Vansteenkiste, M., Lens, W., Luyckx, K., Goossens, L., Beyers, W., & Ryan, R. M. (2007). Conceptualizing parental autonomy support: Adolescent perceptions of promotion of independence versus promotion of volitional functioning. *Developmental Psychology*, *43*(3), 633–646. <https://doi.org/10.1037/0012-1649.43.3.633>
- Solecki, S. M. (2016). *An exploratory study on parental monitoring of adolescent cell phone use*. (Publication No. 10254088) [Doctoral dissertation, Drexel University]. ProQuest Dissertations and Theses Global. <https://www.proquest.com/openview/80b2657e67f175b9a9286ff6b452721/1.pdf>
- Sugie, N. F. (2018). Utilizing smartphones to study disadvantaged and hard-to-reach groups. *Sociological Methods & Research*, *47*(3), 458–491.
- Symons, K., Ponnet, K., Walrave, M., & Heirman, W. (2017). A qualitative study into parental mediation of adolescents' internet use. *Computers in Human Behavior*, *73*, 423–432.
- Taffel, S. (2016). Perspectives on the postdigital: Beyond rhetorics of progress and novelty. *Convergence*, *22*(3), 324–338.
- Tokić, A., & Pećnik, N. (2011). Parental behaviors related to adolescents' self-disclosure: Adolescents' views. *Journal of Social and Personal Relationships*, *28*(2), 201–222.
- Twenge, J. M., Joiner, T. E., Rogers, M. L., & Martin, G. N. (2018). Increases in depressive symptoms, suicide-related outcomes, and suicide rates among U.S. adolescents after 2010 and links to increased new media screen time. *Clinical Psychological Science*, *6*(1), 3–17. <https://doi.org/10.1177/2167702617723376>
- Updegraff, K. A., McHale, S. M., Whiteman, S. D., Thayer, S. M., & Crouter, A. C. (2006). The nature and correlates of Mexican-American adolescents' time with parents and peers. *Child Development*, *77*(5), 1470–1486.
- Valkenburg, P. M., Krckmar, M., Peeters, A. L., & Marseille, N. M. (1999). Developing a scale to assess three styles of television mediation: “Instructive Mediation,” “restrictive mediation,” and “social coviewing.” *Journal of Broadcasting & Electronic Media*, *43*(1), 52–66. <https://doi.org/10.1080/08838159909364474>
- Valkenburg, P. M., Piotrowski, J. T., Hermanns, J., & De Leeuw, R. (2013). Developing and validating the perceived parental media mediation scale: A self-determination perspective. *Human Communication Research*, *39*(4), 445–469.
- Verduyn, P., Gugushvili, N., Massar, K., Täht, K., & Kross, E. (2020). Social comparison on social networking sites. *Current Opinion in Psychology*, *36*, 32–37. <https://doi.org/10.1016/j.copsyc.2020.04.002>

- Vernon, L. (2019). Time-use for the iGeneration: A person-centered approach. *Human Behavior and Emerging Technologies, 1*(2), 91–102.
- Vijayakumar, N., & Pfeifer, J. H. (2020). Self-disclosure during adolescence: Exploring the means, targets, and types of personal exchanges. *Current Opinion in Psychology, 31*, 135–140.
- Viner, R., Davie, M., & Firth, A. (2019). *The health impacts of screen time: A guide for clinicians and parents*. Royal College of Paediatrics and Child Health. https://www.rcpch.ac.uk/sites/default/files/2018-12/rcpch_screen_time_guide_-_final.pdf
- Vogels, E. (2021, June 22). *Digital divide persists even as Americans with lower incomes make gains in tech adoption*. Pew Research Center. <http://www.pewresearch.org/facttank/2021/06/22/digital-divide-persists-even-as-americans-with-lower-incomes-makegains-in-tech-adoption/>
- Vongkulluksn, W. (2016). *Parental mediation of adolescents' technology use at home* [Unpublished doctoral dissertation]. University of Southern California.
- Wang, R., Bianchi, S. M., & Raley, S. B. (2005). Teenagers' internet use and family rules: A research note. *Journal of Marriage and Family, 67*(5), 1249–1258.
- Wartella, E. A., & Jennings, N. (2000). Children and computers: New technology–old concerns. *The Future of Children, 10*(2), 31–43.
- Wisniewski, P., Ghosh, A. K., Xu, H., Rosson, M. B., & Carroll, J. M. (2017). Parental Control vs. Teen Self-Regulation: Is there a middle ground for mobile online safety? In *CSCW '17: Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing* (pp. 51–69). Association for Computing Machinery. <https://doi.org/10.1145/2998181.2998352>
- Yardi, S., & Bruckman, A. (2012). Income, race, and class: Exploring socioeconomic differences in family technology use. In *CHI '12: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (pp. 3041–3050). Association for Computing Machinery. <https://doi.org/10.1145/2207676.2208716>