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COMMENTARY

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Reflections on the meaning of "digital" in research on adolescents' digital lives

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1 | INTRODUCTION

The COVID-19 pandemic marked a step change in society's reliance on digital infrastructure for information, education, work, commerce, entertainment, and communication. More than ever before, and especially but not only in wealthy countries, adolescents are exploring and expressing their identity and autonomy, including risky as well as creative and constructive opportunities. Born into an already-digital world, their present and future imaginaries presume a thorough-going engagement with technology that transcends real/virtual and online/offline binaries. By contrast with older generations (including their parents, teachers, and even researchers), adolescents cannot envisage a return to pre-digital times through any serious limitation of their digital engagement. But, also by contrast with many adults, they can imagine alternative digital futures, and are often keen to discuss how technologies could be redesigned or newly regulated in ways that would better support their well-being and rights in a digital age. As society increasingly pivots towards all things digital and recognizing that the global companies providing digital products and services are becoming hugely powerful in both public and private sectors, governments are making greater efforts to regulate their activities and harness their impacts for the betterment of society. These efforts include turning to psychological and social science evidence for guidance, and listening to the voices of adolescents and those who have their needs and rights in mind.

In commenting on the 11 articles selected for this special issue of the *Journal of Adolescence* on adolescents' digital lives, I reflect on how the findings can inform these efforts and, relatedly, on significant research gaps that future research could usefully address. Let us begin by welcoming the ways in which this issue effectively advances beyond the popular treatment of adolescents as a unitary and homogenous category—often implicit in the celebration of "digital natives" or anxieties about "screen time"—insofar as it explores differences among adolescents, including differences in vulnerability. The special issue distinguishes, for instance, more or less lonely adolescents to explore whether going online supports their efforts at emotional regulation (Scott et al., 2023), and whether adolescents' sensitivity to behavioral avoidance or inhibition is a risk factor for problematic gaming (Bradt et al., 2023). Contextual factors also differentiate among adolescents, potentially rendering some more vulnerable than others, as shown by Menabò et al. (2023), who reveal the importance of peer network and school connectedness in mediating the effect of cyberbullying on well-being. There is more work to be done regarding vulnerability. For example, my colleagues and I recently conducted a systematic review of evidence relating digital experiences to adolescent mental health, identifying multiple ways of conceptualizing adolescent digital experiences; yet, even in a literature concerned with clinical populations, it was not possible clearly to identify disorder-specific digital practices (Kostyrka-Allchorne et al., 2022).

Although this special issue encompasses many insights about adolescent lives, mental health and well-being, further understanding regarding the nature of the digital environment is needed. My contention is that greater technological specificity will enhance both the knowledge to be obtained from research on adolescents' lives in a digital age and the impact of that knowledge on the public policies shaping the provision, regulation, and design of society's digital infrastructure. This is not to disavow other research agendas emerging from the special issue, but simply to highlight one direction of travel that could reap dividends for future research and for adolescents' lives. Hence, I invite adolescence research to transcend the common lack of specificity regarding "the digital," along with the tendency to variously refer to technologies, devices, social

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media, screen media, and ICT (information and communication technology) as if these different terms are synonymous. Instead, let us examine the potential significance of digital features and design, ownership, regulation, norms and values, and cultures of use.

It is a valuable research question in its own right to ask, if researchers were more thoroughly to differentiate among aspects of the digital environment—as they likely would when researching adolescents' interaction with their social environment (family structures, forms of friendship, types of school, etc.)—would the answers be insightful and for whom? Certainly, adolescents themselves make often the finest of nuances among digital products and services, fascinated by their multiple and constantly innovating affordances. When interviewed about their social media use, for instance, adolescents may first check which platform they are being asked about. If asked why this matters, they may further reflect on specific emerging risks or new privacy features or the latest data hack in the news media, or comment on how platforms have changed over time (for instance, when explaining why they left Facebook or miss Twitter or embraced TikTok). Questions on gaming may receive a puzzled frown until the researcher names a particular game or asks the young person to describe their chosen favourites. The interviewer is likely to be told that the very terminology used to phrase their question is confusing, or that they should ask separately about going online with family or friends or alone, at home or at school, for one purpose or in one mood or another.

2 | REFLECTIONS ON THE MEANING OF "THE DIGITAL"

References to digital technologies in the lives of adolescents encompasses many layers of meaning, including the device itself as an object and a brand, the apps installed on it and their various settings, the networks to which young people are thereby connected technologically and socially, the genres of content that characterize their tastes and preferences, the commercial and data-driven business models to which they become subject, the soft and hard regulatory regimes that frame or limit their possibilities, and the cultural and moral norms according to which young people make their digital decisions. So, when the researcher asks adolescents questions such as, how do you feel when you go online, or when they investigate why some adolescents use technology more than others, what exactly is at stake? In comparing digitally mediated and non-digitally mediated experiences, to discover what difference the digital makes, are we really comparing like for like or grasping their mutual dynamics and interdependencies? And, in prefacing key concepts with "digital," as in digital resilience or digital experiences or digital well-being, what changes to the concept are we signaling, and do we really understand each other in so doing?

While research often operates with generalities—adolescents, families, mental health, development, and so forth, for some purposes, attention to the materiality, design, or features of technology may matter. For example, our recent rapid evidence review of families' use of parental control tools, as part of their parental mediation strategy, found that some studies showed beneficial outcomes of using parental controls (e.g., for children's online safety), some showed adverse outcomes (e.g., increased parent–child conflict), and some showed mixed or no outcomes (Stoilova et al., 2023). Because researchers have developed a theory of parental mediation, some conclusions could be drawn about how parental controls bring greater benefits if used as part of an enabling approach to parental mediation, one that recognizes child agency and voice. But because the same research community has not developed an agreed terminology for parental controls, tending to use multiple terms for the same phenomenon and also the same term for different phenomena (Altarturi et al., 2020, distinguish browser-based, search engines, monitoring and tracking, screen/app time controls, and filters of several types), conclusions could not be drawn from the evidence about the optimal design of parental controls. Reporting the findings to regulators or policymakers working to enhance child online protection, or companies ready to deploy such technologies, is impeded when the research studies taken together cannot explain which parental controls work or do not work or are potentially counterproductive.

The materiality, design, or features of technology also matter insofar as these intersect with specific uses by diverse users in contingent circumstances, with variable outcomes (Johannessen, 2023). Evans et al. (2017) distinguished affordances (a genuinely relational characteristic emergent from the interaction of subject and object; Nagy & Neff, 2015) from everyday (and arguably confusing) uses of the term that state a digital technology's features (e.g., a phone affords texting) or outcomes of use (e.g., a phone affords communication). Anonymity, they argue, is neither simply a feature of a technology nor an outcome of its use but depends on and varies according to the interaction of users with specific technology in particular circumstances. For example, chatting in "public" on a global platform, even one with a real name policy, may afford an adolescent anonymity because no-one in their social circle would see them there. For another, playing on a gaming platform with pseudonyms or avatars need not impede their knowing just which schoolfriend they are playing with, and so does not necessarily afford anonymity. Thus Evans et al. (2017) conceptualize privacy settings as features, and privacy itself as an outcome of technology use, where this may be mediated by an affordance such as anonymity. In this special issue, Angelini and Gini (2023) examine the outcomes of specific social media features (asynchronicity and cue absence), finding that these features are linked to better communication among socially anxious adolescents but to worse communication among

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non-anxious adolescents. This suggests that what we might term the affordance of social media richness (Ishii et al., 2019) varies according to the mental health of users; media rich interactions may pressurize anxious adolescents to appear and respond in certain ways, yet these interactions may be rewarding and affirming for more confident adolescents.

Which affordances matter to adolescents and why remains to be addressed. Such research would advance the influential agenda on adolescents' digital lives established a decade ago by Danah Boyd (2014) in her ethnographic analysis of four key digital affordances shaping adolescent interactions and well-being—persistence (of digital content/data), scalability (of flows across networks), replicability (enabling the multiplication and manipulation of content), and searchability (transforming access to and specialization of knowledge). It is also crucial to grasp the dynamic between digital affordances and user activities as part of a broader ecological analysis of adolescents' "digital lives." For example, even if researchers are specific about platforms (Instagram, TikTok, etc.) or context of use (where, when, with whom, why), little research has been conducted regarding the diverse forms of content which adolescents contribute or with which they engage. This is the case for individual interactions and also collectively—notably, we know little of adolescents' participation in online communities, each with their cultural and subcultural dynamics of entry and exit, or norms of care, value, or exclusion. While there are some digital ethnographies of, say, youth civic sites or, contrastingly, pro-anorexia communities, for ethical and methodological reasons these tend to say little about who participates behind the avatar, or how the online relates to adolescents' offline lives.

Social studies of technology have long examined the complex intersections between the material and the social (Lievrouw & Livingstone, 2006). Specifically, they recognize that technology has coevolved with social norms and practices, being especially marked by its largely Western and wealthy origins and business interests yet to some degree open to users' interpretation, agency, and cultural processes of meaning making (Hartmann, 2023). Consider the case of greatest concern to public policy, namely whether and how particular factors shaping user vulnerability intersect with particular forms of technological design, especially risky or compulsive or exploitative design (5Rights Foundation, 2021). Having interviewed young people with a range of mental health difficulties aged 12–22 from Norway and the UK about their digital lives, our ySKILLS research was able to identify some key social media affordances with which adolescents struggled—virality (extreme or exaggerated content designed to "go viral" rapidly across horizontal networks), personalization (algorithmically-driven content tailored to individual circumstances—often referred to by adolescents as "triggering"), and trustworthiness (given the absence or instability of online trust markers for judging peers, influencers, experts, or platforms). The research also showed that, while they were vulnerable because of their mental health difficulties and life circumstances, this did not leave the adolescents passive or unskilled; on the contrary, they were often inventive if unorthodox in their efforts to cope (Livingstone et al., 2022). Hensums et al. (2023) add to this way of thinking by showing that adolescents do not all equally comply with YouTube vloggers' COVID-19 messages.

3 | WHO SHOULD ACT ON FINDINGS ABOUT ADOLESCENTS' DIGITAL LIVES?

Insofar as researchers hope—and strive to ensure—that evidence can inform policy and practice beyond the academy, we can ask, who is likely to find the knowledge encapsulated in this special issue useful, and in what ways? The authors of this special issue call on a range of actors to build on their research—often pointing broadly to the potential for intervention or prevention initiatives, or referring more specifically to the implications of the findings for parents and carers, for teachers and other educators, or for clinicians and professionals whose job is to help adolescents. For example, Kurock et al. (2023) shows that parents are finding ways to identify and scaffold information-related online opportunities in response to adolescents' help requests, thereby also supporting their autonomy and learning. As has been shown in the parental mediation literature (Van den Bulck et al., 2016), child-initiated forms of joint media engagement (Takeuchi & Stevens, 2011) can be particularly productive, with children and parents providing mutual support and benefit through each being sensitized to the needs of the other. All these are indeed important, together providing a vital ecosystem of support for young people faced with the multiple challenges posed both by digital technologies and also by all the domains of life with which these intersect (think of new modes of learning and expression, changing forms of employment and innovative careers paths, or amplified risks of hate, abuse or aggression now encompassing adolescents' online as well as offline lives).

But other actors also have a role to play, and responsibilities to enact, and it is worthwhile to consider how they, too, may be tasked with reviewing and learning from research on adolescence. While Kurock et al. conclude with a call for schools to jointly empower parents and adolescents in gaining information-seeking skills, and this is indeed a valuable aim, it is also worth noting that digital literacy by design (as promoted by the UK communications regulator, Ofcom, 2023) could also play a role, for instance through requiring that informational interfaces or search functionality are designed in ways that support joint or collaborative as well as individual uses. Indeed, I suggest that two categories of actors have notable power in this domain—policymakers, especially governments who can legislate or regulate or establish standards and incentives for the public and private sector; and companies, especially those who provide digital products and services likely to be used by or

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impact on adolescents, and which may, even if not specifically regulated to promote rather than undermine adolescent well-being, choose to learn from research on what helps or harms adolescents or what could ease the burden of support experienced by their parents, teachers, or clinicians.

While regulatory or design initiatives require an initial investment of attention and resources, largely by public and private sector policymakers, thereafter their reach can be both scalable and sustainable and the benefits evenly spread. By contrast, initiatives that rely on parents, teachers, or clinicians, while potentially easier to tailor to the individual needs and circumstances of each adolescent, can be expensive to roll out, whether through training or awareness raising or other public outreach, as well as difficult to sustain and, too often, taken up more by privileged than neglected segments of society. For example, Favini et al. (2023) design a school intervention to enhance adolescent self-efficacy to combat what they term social media "addiction." This illustrates well the challenge for public policymakers: would they do better to fund annual, nation-wide, school-based interventions to prevent excessive use of social media or, instead, should they develop regulation to restrict digital platforms' use of certain design features shown to be compulsive (such as personalized algorithms or endless scroll and autoplay in video feeds or lootboxes in gaming). The challenge applies to researchers also: how should we apportion our research efforts to inform and also withstand the cut-and-thrust of public budget setting between establishing the risk of harm to adolescents, the potential for educational interventions or the effectiveness of regulatory interventions to mitigate such harm? Meeting this challenge raises questions about how research may be useful for and used by policymakers (Staksrud, 2013). Researchers may need to consider not only the strength of evidence (is the methodology robust, the effect sizes substantial, and the recommendations supported by the weight of evidence across studies) but also the feasibility of the interventions or regulations proposed (are these practical, ethical, affordable, have they been codeveloped with the affected communities and, most difficult, is there the political will to introduce them?).

If we do bring public and private sector actors into our purview, new research questions also arise. For instance, what are the implications for the design of social media platforms that lonelier adolescents seem initially to benefit from digital emotional regulation but that the benefit wears off quickly, such that adolescents who practise digital emotion regulation can feel worse the next day (Scott et al., 2023)? Or, since Angelini and Gini (2023) find that social media richness helps confident adolescents but undermines those with social anxiety, what evidence can guide society's decision about whether and how to regulate for or against social media richness or to advise the clinicians supporting adolescents with social anxiety? This last question is something we worked on in our above-mentioned ySKILLS research; having drafted our findings, we then workshopped the emerging messages for mental health professionals with some of our interviewees (ySKILLS, 2023). Itself a rewarding though challenging exercise, the resulting messages trod a careful line between specificity and generality, recognizing that both digital technologies and adolescent needs vary considerably and interact in complex ways, yet that clinicians must find a practical way to engage with these issues, it no longer being feasible for them to sidestep the digital dimensions of adolescent lives and the accompanying problems (Aref-Adib et al., 2020).

4 | LAST WORDS

To fully grasp the challenges of adolescence in a digital world, and to understand what difference the "digital" makes to their lives, researchers need now to consolidate and advance beyond the growing recognition that nonspecific concepts of technology "use," often measured simplistically as "screen time" and conceived reductively as a unitary activity conducted in undifferentiated digital contexts that assumes harms in ways that obscure possible benefits or mixed outcomes (Livingstone, 2021). In this commentary, I have invited further reflection on the meaning of "the digital," recognizing and even relishing that this may take research on adolescence in new and multidisciplinary directions. Looking across the 11 articles in this special issue, their breadth of coverage suggests multiple research directions. Third et al. (2019) distinguish three approaches to conceptualizing "the digital": (i) how people use digital media or technologies—this is to focus on the digital as tools, devices, contents, and services; (ii) how people engage within digital spaces or environments, focusing on whether and how these extend or transform or reinvent the possibilities for action and interaction; (iii) how society itself is reshaped by the increasingly wholesale adoption of digital infrastructures for information, education, work, commerce, entertainment, communication, and more—health, politics, welfare and, arguably, all other domains (Plantin et al., 2018).

The first approach raises research questions about use or non-use or amount or type of use of digital technologies, including questions about the outcomes of such use and differences or inequalities in access or outcomes for different population segments. The second tends to compare online and offline—for example, by asking whether offline and online need-based experiences add equally to adolescents' well-being (Van de Casteele et al., 2023) or whether both offline newspapers and online Twitter messages on the Ukrainian war influence adolescents' prejudice against minorities (Bobba et al., 2023). These studies often conjure the notion of distinct spaces—"virtual" or "real"—although the virtual space remains hard to characterize, whether as somehow separate from or embedded in the real (in-person, embodied, material) space that research has long grappled with. The third approach invites more historical and system questions, ultimately concerning the notion of a "digital world" or "digital age," as referred to in this commentary. Although more overarching than the relatively

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individualistic approach taken in this special issue, the transformations of a digital world can be discerned as motivations for research—consider Strohmeier et al.'s (2023) concern that adolescent girls do not fall behind the boys in the "digital career aspirations" needed for a digital society, or Lamash et al.'s (2023) assumption that, as social interactions become digitally mediated, new skills are required to ensure well-being. Some discussions of artificial intelligence or the "metaverse" also raise the prospect of wholesale societal transformations.

Digital technology continues to change apace. In the late twentieth century, television was talked of as a "push" technology (a "sit back" technology, according to marketers) while "the internet" was a "pull" (or "sit forward") technology, celebrated for empowering its newly active users to choose where they wanted to go today (to paraphrase the then-famous Microsoft advertising). Today, the situation is reversed, as television viewers face a bewildering array of broadcast, catch-up, and streaming services, while internet users have content "fed" to them by personalized algorithms closely tailored to sustain their undivided and unending attention. Understanding the dynamic between technological design, business innovation, evolving regulation, and user creativity (include workarounds, hacks, and resistant practices) calls for an interdisciplinary lens encompassing all three approaches to the digital—as tools or devices, as space or environment, and as societal infrastructure. The challenge for researchers of adolescents' digital lives is both daunting and exciting.

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