Review

Social Media and Well-Being: Pitfalls, Progress, and Next Steps

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Within a relatively short time span, social media have transformed the way humans interact, leading many to wonder what, if any, implications this interactive revolution has had for people's emotional lives. Over the past 15 years, an explosion of research has examined this issue, generating countless studies and heated debate. Although early research generated inconclusive findings, several experiments have revealed small negative effects of social media use on well-being. These results mask, however, a deeper set of complexities. Accumulating evidence indicates that social media can enhance or diminish well-being depending on how people use them. Future research is needed to model these complexities using stronger methods to advance knowledge in this domain.

The Puzzle: Does Social Media Impact Well-Being?

Humanity had flirted with the idea of building a machine capable of spreading ideas quickly throughout the world for over 2000 years before all of the pieces necessary to do so finally came together for Johannes Gutenberg in the mid-1400s, while he was working on the shores of the Ill River in Strasburg [1]. It rested largely on Gutenberg's invention of a technique for pressing movable type (think of a scrabble set made of metal) against paper and ink to create a printed page [1] (https://www.britannica.com/biography/Johannes-Gutenberg). Prior to Gutenberg's invention, it would take up to 2 months to produce a single copy of a book. Now printers could produce 8000 copies during the same time [1].

The effect that the printing press had on society over the next 100 years was transformative. Suddenly people could read each other's ideas, transmit new concepts, and respond to what others were thinking. The printing press would help scientists and innovators disseminate their discoveries, acting as a major force that propelled the Enlightenment [1] (https://www.history.com/news/printing-press-renaissance). However, the printing press also ushered in negative outcomes. The democratization of ideas meant that any idea could proliferate, including those that fomented hate and fear. For example, the Protestant Reformation, a particularly violent period in European history, was driven by the ease with which Martin Luther could spread beliefs that at the time were viewed as heretical (https://www.history.com/news/printing-press-renaissance).

Looking back at it now from the vantage point of the 21st century, the invention of the printing press provides an apt analogy for the world in which we are now living [2] (https://www.theatlantic.com/magazine/archive/2020/01/before-zuckerberg-gutenberg/603034/). In the early 2000s, **social media** (see Glossary) proliferated and revolutionized the way the world communicates once again [3]. Close to 4 billion people use Facebook, Instagram, or Twitter, three of the most popular **social media platforms**, to share and consume information (https://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/). Given the transformational impact that this technology has had on society, it is unsurprising that people the world over have become interested in understanding how these media influence their emotional lives.

Highlights

Social media has revolutionized how humans interact, providing them with unprecedented opportunities to satisfy their social needs.

An explosion of research has examined whether social media impacts well-being. First- and second-generation studies examining this issue yielded inconsistent results.

An emerging set of third-generation experiments has begun to reveal small but significant negative effects of overall social media use on well-being.

The results of these experiments mask the complexities characterizing the relationship between social media and well-being. Whether it enhances or diminishes well-being depends on how and why people use it, as well as who uses it.

People use social media for different reasons (e.g., to manage impressions, to share emotions), which influence how it impacts their own and other people's well-being.

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Over the past 15 years, an explosion of research has addressed this issue. Yet, the results of this work are far from straightforward. While some studies indicate that social media undermine **well-being**, other studies suggest the opposite, or that social media have no implications for this facet of people's lives. These seemingly contradictory sets of findings have elicited heated debates among scientists, leaving many confused (e.g., [4–6]). With this broader context in mind, our goals in this review are to synthesize what we have learned about the relationship between social media and well-being to highlight future research directions that are essential to propel this work forward.

To anticipate our conclusion, our analysis suggests that, like the printing press, there is nothing inherently 'good' or 'bad' about social media. Whether they help or harm well-being depends on how and why people use them, along with who uses them (Figure 1, Key Figure). Before discussing the research that supports this view, however, we begin by discussing the ostensibly simple question that instigated much of the debate in the first place: does the overall amount of time that people spend on social media influence their well-being?

The Search for Aggregate Effects

Research examining the links between social media use and well-being began to proliferate in the mid-2000s. Most of these early papers focused on Facebook, and that remains true to date [7–9].

Key Figure

How Does Social Media Impact Well-Being?
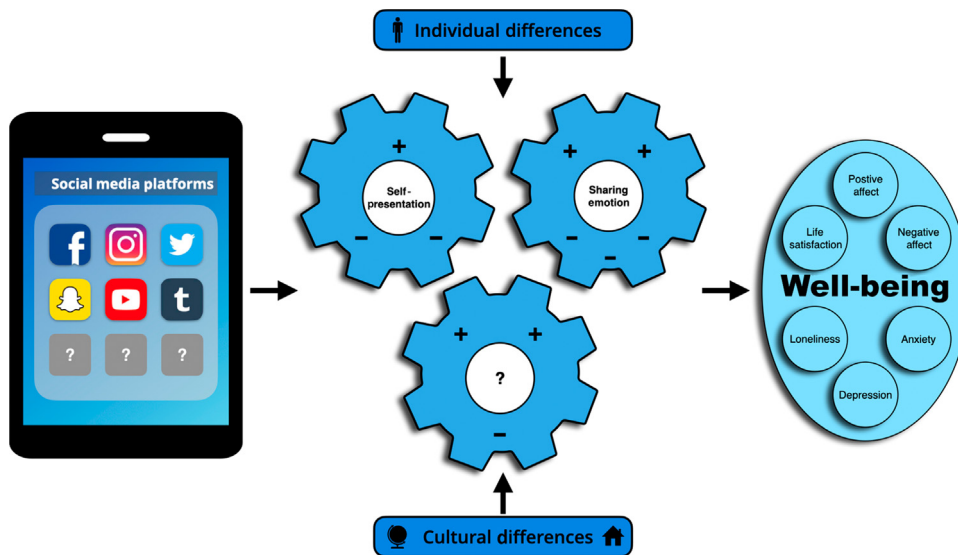

Trends in Cognitive Sciences

Figure 1. The image on the left indicates that there are many social media platforms, and new ones (reflected by the question marks) are constantly developing. To understand how these platforms impact well-being, research needs to explicate the processes they activate, a sample of which are highlighted in the center image, with plus and minus signs connoting the fact that the same process may have positive and negative effects on well-being depending on the context in which they are engaged (see main text for discussion). The different numbers of positive and negative signs associated with each process highlight the fact that heterogeneity also exists in the degree to which different processes may impact well-being. These processes may interact with each other, as well as individual and cultural differences, to influence well-being. The image on the right illustrates the fact that researchers frequently use the term 'well-being' to refer to different constructs. A key challenge for future research is to more precisely characterize how (i) different social media platforms (ii) impact different psychological processes, which in turn (iii) influence different facets of well-being.

Glossary

Active social media usage: engaging in social media activities that facilitate interactions with others (e.g., chatting, or broadcasting information).
Bonding social capital: the resources we derive through the strong ties we maintain with members of close groups.
Bridging social capital: the resources we derive through the weak ties we maintain with people outside our close groups.
Cross-sectional methods: observational research that examines the relationships between data collected at the same time point.
Cyberbullying: use of electronic media to perform intentional, aggressive acts against others who cannot easily defend themselves.
Emotional support: expressions of care and concern.
Experience sampling: a longitudinal method that involves measuring people's behavior and/or psychological states multiple times per day, often over the course of several days.
Fear of missing out (FOMO): describes the fear of missing out on important events, a negative psychological state that propels compulsive social media use and promotes stress, negative affect, and fatigue.
Informational support: provisions of advice.
Jingle-jangle problem: a situation in which different terms are used to refer to the same process (e.g., using 'social media', 'online social networks', and 'digital screen time' interchangeably, using both 'depression' and 'life satisfaction' to refer to well-being) and the same terms are used to refer to different processes (e.g., using social media to refer to Facebook, Instagram, and LinkedIn).
Longitudinal design: a design method that involves collecting multiple measurements on the same individual over time.
Meta-analysis: a statistical method that aggregates effect sizes across multiple studies to enhance the power of detecting a significant effect.
Moral outrage: the anger and shock people experience in response to a perceived moral violation.
Passive social media usage: monitoring information on social media without engaging in direct exchanges with others.

That said, variability exists in terms of the social media platforms that have been researched, and many studies lump together different platforms to draw general conclusions about social media's implications for well-being (Box 1). Thus, we cast our discussion here at the more general level of 'social media'.

The first crop of papers that emerged from this work used self-report, **cross-sectional methods** to examine the association between social media use and well-being. Indeed, a comprehensive review of the literature concerning Facebook that included all articles published between 2005 and 2011 did not reveal any research examining how social media use influenced well-being over time [10]. The results of these early cross-sectional studies were inconsistent (for reviews see [11,12]). While some revealed negative associations between social media use and well-being, others revealed positive links or results that were moderated by individual differences (e.g., online social network size, depressive symptoms, gender, loneliness).

These contradictory findings motivated a second generation of studies that began to appear in the early 2010s, which used more sophisticated methods (e.g., **experience sampling**, large-scale **longitudinal designs**, advanced modeling techniques) to shed light on the puzzle that had emerged. The outcomes of this work were, however, no more conclusive; they likewise failed to generate a coherent pattern of results. Some studies linked aggregate social media use with declines in well-being over time [11,13–16], while other work revealed no substantive links (e.g., [17–22]) or relationships that were nonlinear or again moderated by individual differences [20,23–25].

It is not uncommon to see discrepant findings emerge in a growing literature, especially when it deals with a multifaceted phenomenon such as social media usage. However, two features of these second-generation studies make them challenging for drawing conclusions (Box 1). First, they are not consistent in how they operationalize and assess social media use or well-being; while some studies examine the impact of short bursts of specific kinds of social media platform usage on momentary affect over the course of minutes or hours, others focus on longer periods of usage or collapse across multiple platforms and focus on other facets of well-being. Second,

Perceived social support: believing that there are people you can turn to for support.
Received social support: receiving assistance from other people.
Social comparisons: the act of comparing oneself to others.
Social media: online platforms that allow people to create and share information with others.
Social media platform: the specific type of online platform that allows people to create and share information (e.g., Facebook, Twitter).
Trolling: deliberate posting of inflammatory and divisive information to upset others.
Upward social comparisons: comparing yourself with someone who is outperforming you (as opposed to a downward social comparison, in which you compare yourself with someone who you are outperforming).
Well-being: a concept that captures how happy people are ('affective well-being') and how satisfied they are with their lives ('cognitive well-being'). Although these facets of well-being often correlate, they capture distinct constructs. In the social media/well-being literature, additional constructs are often subsumed under the heading of well-being, such as depression, loneliness, anxiety, and FOMO.

Box 1. The Jingle-Jangle Problem

Research on social media brings together scientists from many backgrounds. The interdisciplinary nature of this enterprise is an asset: diversity breeds innovation [105]. However, one unintended byproduct of this amalgamation of perspectives is that we are now faced with what psychologists and philosophers refer to as a **jingle-jangle problem** [106,107]: a situation in which different terms are used to refer to the same process (e.g., using 'social media', 'online social networks', and 'digital screen time' interchangeably) and the same terms are used refer to different processes (e.g., using social media to refer to Facebook, Instagram, and LinkedIn, using well-being to refer to depression and life satisfaction).

Jingle-jangle fallacies are endemic to many areas of science. On the one hand, they are characteristic of flourishing areas of work that bring together researchers from different backgrounds. On the other hand, they can pose a major obstacle to building integrative and appropriately nuanced models of psychological phenomena. To illustrate, consider the case of different research groups using the same term 'social media' to refer to different platforms such as Facebook or Twitter. Facebook and Twitter share many features, but they differ notably in structure and usage norms as well. Whether the differences that distinguish them are relevant for people's well-being is a question for scientists to answer, but referring to these platforms with the same label can lead us to gloss over potentially meaningful distinctions [9] (see Figure 1 in main text). The same is true for well-being. Although depression and life satisfaction are both related to well-being, substantive differences distinguish these constructs [50].

Researchers have made admirable attempts to address social media's jingle-jangle problem over the years [7,108], but a close reading of the literature indicates that it persists [109]. Moving forward, a key challenge is for scientists to agree on a common lexicon that captures the full range of variables that are relevant to the study of social media and well-being.

recent findings indicate that the self-report measures of social media usage that many of these studies use have questionable validity. One study of approximately 50 000 people from 15 countries found, for example, that ten popular survey measures of people's Facebook behavior correlated only weakly (r between 0.23 and 0.42) with people's actual Facebook usage [26].

A major leap forward occurred in the mid-2010s, when experiments, the gold-standard tool for drawing causal inferences, began to examine the effect of manipulating aggregate social media usage on well-being. Although the total number of such studies remains small and there are caveats associated with them (i.e., they vary in how they manipulate social media use, do not consistently focus or document effects on the same measures, and rely on convenience samples where self-selection biases are a concern), a set of results linking social media use with small but significant declines in well-being has begun to emerge. For example, of the eight aggregate usage experiments described in one exhaustive open-source review compiled by scholars on both sides of the social media/well-being debate (J. Haidt and J. Twenge, unpublished), six revealed a negative effect of aggregate social media use on some [27–29] or all [30–32] of the well-being measures they administered (although 37's effects were specific to Instagram, not Facebook). By contrast, one experiment revealed mixed positive and negative results [33] and another null [34] findings.

So, Where Does this Leave Us?

Although many experts increasingly acknowledge that small negative effects characterize how aggregate social media use impacts well-being (Box 2), some argue that the size of these effects are so small that they have no practical significance [35]. Others have called for methodological reform, highlighting the need for future research to use stronger designs and more valid measures [35,36]. The first of these positions is defensible and we strongly agree with the second. However, in our view, both fail to address an equally important – and arguably deeper – psychological issue. Namely, that the story surrounding social media's impact on well-being is much more nuanced than these aggregate studies suggest and by restricting our focus to overall usage,

Box 2. Meta-Analyses

Meta-analyses are statistical tools that aggregate effect sizes across studies to increase the power needed to detect significant effects. Researchers have increasingly turned to them to sort through the conflicting findings that characterize the literature on social media and well-being.

Across meta-analyses published to date, researchers have documented a statistically significant negative association between social media usage and well-being [77,110–112], a finding that is consistent with the experimental work reviewed in the text as well as several recent systematic reviews of the literature [4,6,35]. The size of this meta-analytic effect is small. One review estimated that overall social media use explains 1% of the variance in well-being [6]. However, the results of two recently published meta-analyses add important nuance to this finding.

Liu and colleagues [70] found, for example, that using social media to interact with others was associated with improved psychological well-being whereas passive consumption of information on social media was linked with reduced well-being. The size of these meta-analytic effects were roughly twice as large as the overall effect of social media use on wellbeing. An additional meta-analysis that focused on depression and social media usage [112] revealed a similar set of findings. Using social media to engage in harmful social comparisons was linked more strongly with depression than overall social media usage.

Overall, the results of these meta-analyses are consistent with the idea that a small relationship characterizes the effect of social media on well-being. They also reinforce the value of distinguishing between different facets of social media usage to understand how this technology impacts well-being. There are, however, two important caveats when considering how these meta-analytic results factor into the emerging knowledge base on social media and well-being. First, meta-analyses are only as informative as the studies that comprise them. If a meta-analysis includes a disproportionate number of studies characterized by weak or problematic methods, their results should be appropriately qualified. Although it is possible to take study quality into account when performing meta-analyses, this is not always done. Second, meta-analyses often collapse across measures that are conceptually related but distinct (e.g., general mood vs depression, social media usage over the course of minutes vs days). This can lead one to gloss over distinctions that are, in some cases, meaningful.

we risk losing sight of how this technology can modulate well-being for better or worse, and we lose the opportunity to develop a fine-grained understanding of the psychological mechanisms that govern how it operates.

From 'Does' to 'How': A Process Perspective

In this section, we review research that illustrates how considering the psychological processes that drive people's social media behavior can help explain when using this technology leads to well-being improvements or declines. Our goal in focusing on the two processes we discuss – self-presentation and sharing emotions – is not to be exhaustive of the different reasons why people use social media or the myriad ways that it can influence well-being. Rather, it is to demonstrate the value of moving past asking questions about aggregate social media usage. In this vein, we focus on two sets of psychological processes that decades of research indicate are foundational to how people function, which have been extensively studied in a social media context.

Self-Presentation

In 1956, Erving Goffman published a landmark book titled *The Presentation of Self in Everyday Life* [37]. It argued that life is like a dramatic performance. The stage we act on is life, and we assume different roles when we interact with different people with a particular goal in mind: to manage how they perceive us. According to Goffman, we are never free of this built-in human theater. We are acting all the time.

A great deal of research and theory supports Goffman's thesis: we spend much of our time trying to manage what others think of us [38,39]. There are, however, limits to the degree that we can engage in this process offline. We can do our best to primp and prep before a job interview in our homes, but ultimately we have limited control over what happens when we leave. Countless unpredictable obstacles can get in the way of presenting our best selves when we navigate the world offline.

Social media, by contrast, provide us with new opportunities to curate the way we present ourselves [40–42]. We can post our most glamorous photographs and upload our wittiest posts. Managing how we present ourselves in this way can have positive consequences [43]. Experiments show that asking people to view their social media profile increases their self-esteem [44,45] and their ability to manage negative feedback [46]. Some evidence suggests that people are, at some level, aware of these benefits. For example, one experiment found that people spontaneously viewed their own profile after receiving rejection feedback, presumably to improve their mood [46]. But curating the way we present ourselves on social media can also have unintended negative consequences: it can lead us to feel worse when we compare our own lives against those we see depicted on social media (for a review see [47]).

Social comparisons are a cross-cultural phenomenon that emerge in early childhood and have deep evolutionary roots [48,49]. We engage in them because they provide us with often useful information regarding how we stack up against our peers. However, when we compare ourselves to people on social media who are outperforming us (i.e., an **upward social comparison**), we end up feeling envy and distress (e.g., [50–59]). Emerging evidence has also begun to link upward social comparisons on social media with the experience of **fear of missing out (FOMO)** [60], meaninglessness [61], and body-image dissatisfaction [55,62].

To put the magnitude of this issue in perspective, consider one study that asked 37 729 participants from 18 different countries to indicate whether they had compared themselves with others

on Facebook over the past 2 weeks in a way that made them feel badly [63]. Approximately 8500 participants – 22.5% of the sample – answered affirmatively. Moreover, of those participants who reported engaging in social comparisons, approximately one-third indicated that their negative feelings persisted for 1 day or more (also see [64]). If you think about these results in terms of the close to 3 billion people who use Facebook, they raise the possibility that a substantial portion of people may be negatively impacted by engaging in social comparisons (i.e., approximately 675 million if you generalize from these results).

There are caveats. Certain kinds of upward social comparisons are more harmful than others (e.g., focusing on others' abilities vs opinions [65]). Moreover, as the heterogeneity of the effect characterizing the large, multicountry study of social comparisons that we just described suggests (roughly three-quarters of the sample did not compare themselves with others in a way that made them feel bad), some people are more vulnerable to the negative effects of social media comparison then others (i.e., people who are depressed or overly prone to engaging in social comparisons [64,66–69]). These exceptions notwithstanding, converging evidence highlights how engaging in social comparisons on social media undermines well-being [70].

To the degree that people spend more time on social media voyeuristically consuming information about others than viewing their own profiles [43,50,71] and are more sensitive to negative than positive experiences [72,73], this could explain why the overall effects of social media usage on well-being tilt slightly in the negative direction. More broadly, this literature demonstrates how the human drive to manage impressions plays out on social media in complicated ways, some of which can have beneficial consequences for the self but negative implications for others.

Sharing Emotions

Decades of research indicate that when we experience strong positive and negative emotions, we are intensely motivated to share them [74]. According to Rime's Social Sharing Theory of Emotions, doing so helps us pursue two goals: the satisfaction of our socioemotional needs, which involves obtaining support from others to help us validate our feelings, normalize our experiences, and savor positive states, and our cognitive needs, which involve receiving advice from others to help us make sense of our experiences.

Social media provide people with unprecedented opportunities to pursue these goals [75,76] by allowing us to instantly connect with people we are close to (i.e., **bonding social capital**) and more distantly acquainted (i.e., **bridging social capital**) [77]. Indeed, a wide range of studies indicate that social media provide feedback that satisfies people's socioemotional (i.e., '**emotional support**') and cognitive (i.e., '**informational support**') needs and enhances their levels of **perceived** and **received social support** (for reviews see [6,78,79]). In some cases, the support benefits that people derive from social media outweigh those they obtain in the offline world. For example, one pair of studies found that people with depression, who tend to receive less support then their non-depressed counterparts offline [80], received more support on social media [81].

As with research on social comparisons, there are caveats associated with these findings. For example, the more one interacts with members of one's network and the faster one receives responses from them, the higher their perceptions of support [82]. Moreover, for reasons that are not yet clear, males, Euro-Americans, and younger students tend to benefit less from social media support then females, Asians, and older students [78]. Nevertheless, extant research supports the idea that social media bolster people's actual and perceived support, variables that are centrally relevant to well-being [83,84].

But just as social media provide us with new opportunities to seek and provide support, they also allow us to share our feelings in ways that hurt others. In this vein, a large literature shows that social media provide people with platforms for **cyberbullying** and **trolling**, moderately prevalent (range: 10–40% [85,86]) antisocial behaviors that negatively impact others' well-being (e.g., [87–89]). Although individual differences play a role in determining who engages in these acts [85,90], certain features of social media promote them. For example, social media strip away cues that activate empathic responses during face-to-face interactions, which constrain aggressive behavior (e.g., [91–95]). They also make it easier for people to share their emotions when they peak and are most motivated to do so [96,97].

Social media also plays a role in spreading **moral outrage** [97–99], which contributes to the dehumanization of others [100] and may reduce collective action [101] and deepen social divides [97]. Emerging evidence suggests that social media are particularly adept at spreading indignation. For example, one experience-sampling study found that people were more likely to both come in contact with and respond intensely to declarations of moral outrage online (likely including social media) versus offline [102].

Taken together, these findings demonstrate that social media provide us with a new platform to satisfy our desire to share emotions with others. In some cases, these divulgences are linked with positive well-being outcomes, providing new opportunities for people to obtain social support. However, they can also promote negative outcomes by providing a platform for cyberbullying, trolling, and spreading hate.

Moving Forward

We have drawn multiple parallels between the printing press and social media in this review, but there is one notable difference. Whereas the printing press took decades to revolutionize the way society functioned, social media have had a transformational impact in a tiny window of time. Nevertheless, scientists have been remarkably nimble in their ability to reroute their research programs to respond to the challenge of making sense of how this technology impacts people's emotional lives. Indeed, we view the past 15 years of research on social media and well-being as a testament to scientists doing what they do best: focusing on important phenomena, critically evaluating current knowledge in light of new results, and bringing to bear increasingly sophisticated methods and conceptual frameworks to generate novel solutions that have important basic science and practical implications. But where does all of this work leave us in terms of the question on so many people's minds: how do social media influence well-being?

Converging reviews of the literature suggest that a small but significant negative relationship characterizes the effect of social media on well-being (Box 3). If this is all that one cares about, that is the bird's eye view. It would be a mistake, however, to conclude from these findings that social media have little potential to influence people's emotional lives. Our survey suggests that the situation concerning social media's impact on well-being is considerably more nuanced than aggregate usage studies suggest. The effects of social media on well-being are not uniform. Social media present people with a new ecosystem for engaging in social interactions, and converging evidence indicates that how this ecosystem affects our well-being, and the well-being of others, depends on how we navigate it.

If social media have both positive and negative implications for well-being, one question concerns why the dominant narrative in the media has disproportionately focused on its dire consequences [6]. The newsworthiness of such headlines is likely to play some role in explaining this phenomenon, but we suspect it is not the only factor. In this vein, it is worth highlighting the fact that one of

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Box 3. Beyond 'Active' versus 'Passive' Usage

In an attempt to integrate research showing that different ways of using social media differentially impact well-being, several groups have distinguished between two general categories of social media usage: '**active**' and '**passive**' **social media usage**. According to this framework, the passive consumption of information on social media undermines well-being by increasing upward social comparisons. Conversely, the active use of social media to exchange information and to connect with others enhances well-being by enhancing social capital and support.

This framework has proved useful in pushing the field to think more mechanistically and has revealed differential negative effects of passive (vs active) use (Box 2). Nevertheless, further refinement of this framework is necessary; current research suggests that it is too coarse. As we discuss in the main text, although passively viewing other people's social media profiles reliably undermines well-being, passively viewing one's own profile has the opposite effect. Likewise, although actively using social media to garner support improves well-being, actively using it to cyberbully or spread moral outrage undermines well-being for others. Thus, a key challenge is to move beyond this nominal distinction to examine subtypes of active and passive social media use. In particular, two questions are pressing.

First, we need to understand how different motivations for using social media interact to influence well-being. Extant research has primarily focused on how different social media motivations operate in isolation. However, human behavior is multiply determined; multiple goals drive people's behavior, which are activated to various degrees depending on individual differences and the circumstances people find themselves in [113,114]. And in some cases, motivations conflict. For example, a person may be driven to abstain from viewing others' profiles to avoid feeling envy, but simultaneously motivated to share their emotions with others. Which of these motivations is stronger may influence whether and how people interact with social media and the implications that doing so has for their well-being.

Second, research is needed to examine whether people are aware of the implications that their social media behavior has for themselves and others. Our review suggests that an asymmetry characterizes how several social media behaviors impact the self versus others. For example, curating one's profile improves how one feels, but promotes envy among others; cyberbullying disproportionately impacts the targets (vs perpetrators) of such behavior. Whether people are aware of these asymmetries is unknown, as are the consequences of informing them about them for regulating their social media behavior.

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psychology's most foundational findings concerns our tendency to overweight negative (vs positive) information [72,73]. Thus, it is possible that people form generalizations about social media's overall well-being impact based on the negative effects they have in some situations (e.g., upward social comparisons, cyberbullying). A key challenge moving forward is to identify how to disseminate information about social media's positive and negative implications without having the latter obscure the former.

From a basic science perspective, future research is needed to move beyond asking broad questions about the overall effects of social media on well-being (see Outstanding Questions). Rather, the strategy now should be to study the different psychological processes that explain how and why social media impact well-being differently, whether different social media behaviors have downstream effects that extend beyond well-being (e.g., to impact family and school life), and why these effects may vary for different people in different cultures guided by distinct social norms. Although we focused on two candidate processes in this review that have been the focus of extensive research, many other processes are waiting to be examined. Work should continue to profile how target processes operate in isolation but also explore how they interact (Box 3).

Studies that seek to address the latter issue should also consider the unique information-processing dynamics that may underlie different types of social media behaviors. Managing one's online persona would seem, for example, to be a reflective act that requires time and deliberation to implement. Sharing emotions with others, by contrast, may be a more reflexively driven behavior. Understanding the degree to which different social media behaviors are reflexively versus reflectively driven has the potential to both illuminate the processes that underlie them and inform the development of interventions designed to enhance social media's impact on well-being [102].

Focusing more on psychological processes also has the potential to provide insight into the question of how different social media platforms uniquely impact well-being. By focusing on the processes that different platforms activate, as opposed to simply comparing Platform A (e.g., Facebook) versus Platform B (e.g., Instagram), we can move beyond the nominal distinctions that distinguish platforms, to the more meaningful psychological variables that influence users' experience (Figure 1).

This issue is also relevant to the emerging experimental literature examining the impact of manipulating aggregate social media use on well-being. Extant research manipulates social media usage in a variety of ways. Some work contrasts experimentally induced abstention against regular usage (e.g., [33]) while others contrast induced usage against an active or non-active control (e.g., [32]), and there is further heterogeneity within these broad approaches (e.g., in the length of abstention/usage, simple abstention vs deactivation of accounts). Each of these different manipulations may activate a different set of underlying processes that have implications for people's well-being.

Studying psychological processes requires, however, that we utilize strong methods. The field's overreliance on cross-sectional designs is a major weakness [35,36], yet cross-sectional research continues to proliferate. We urge researchers interested in exploring the social media–well-being relationship to incorporate experimental and longitudinal designs into their work to strengthen their ability to draw inferences about causality.

More work is also needed to validate the methodologies we use to study the impact of social media on well-being. We have already discussed the validity concerns associated with commonly used self-report Facebook usage variables. However, similar issues apply to other measures used in this area. For example, one prominent study counted the number of emotion words contained in people's Facebook posts to draw inferences about how they felt although no validation data supported the use of such methods to track people's emotions on social media [103]. As later research pointed out, counting emotion words does not track how people feel on Facebook [104]. The take-home point is simple: psychometrically sound measures are not a luxury: they are instrumental for valid inferences.

From a translational standpoint, there is a need to identify science-based interventions that enhance the positive and minimize the negative consequences of social media. There are at least three paths to studying these interventions (Figure 2). One involves directing people to use social media in particular ways, and then gauging the implications of such person-focused interventions. Much of the existing experimental work in this area takes this form. A second path involves examining how modifying the social media platforms that people use (with their informed consent) impacts the way they use them and how they affect well-being. For example, a platform could be augmented to promote the sharing of information that research suggests should enhance well-being. Finally, a third method involves a combination of the previous two approaches; that is, simultaneously educating people about how to navigate social media optimally and tweaking social media platforms to maximize their positive impact.

Concluding Remarks

Social media, like the printing press, represent a kind of disruptive technology that appears once in a generation. Over the past 15 years science has done an admirable job advancing our understanding of the impact these media have on our well-being, but the work is by no means complete. Numerous questions remain. Given the energy and enthusiasm characterizing work in this area, and the enormous level of talent working on solving these questions, we suspect

Outstanding Questions

Can we find a common lexicon to conceptualize the social media landscape? Addressing this issue is vital to solving social media's jingle-jangle problem (Box 1).

Can we develop theory-driven frameworks to identify candidate processes that explain how social media impacts well-being and generate predictions about how they operate in isolation and interactively? Can such frameworks be used to distinguish between different social media platforms?

Can we make further distinctions within active and passive social media usage? Do different active and passive behaviors relate to different psychological processes? Are some behaviors more impulsive versus deliberate? How might these different behaviors impact well-being?
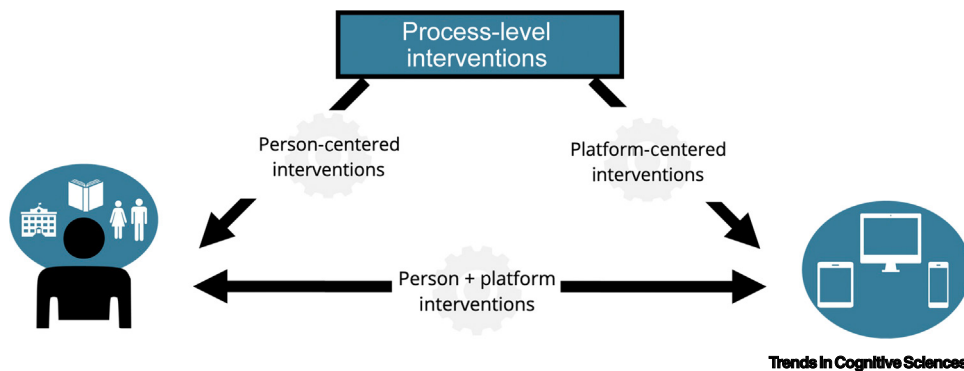
Do asymmetries in the way certain social media behaviors impact the self versus others help to explain why some harmful practices persist? If so, how can such information be utilized to inform interventions?

Can we systematize the way we perform experiments on social media? Some experiments direct people to abstain from using social media while others direct them to use it more compared with baseline. Heterogeneity also characterizes the time course of different manipulations, the measures used to document their effects, and the frequency of their administration. All of these factors could differentially impact study results depending on the nature of the process being manipulated.

How can we balance the need to perform studies quickly on an evolving technology without compromising the need to use valid measures and methods?

Can we design person- and platform-centered interventions that amplify the positive and diminish the negative implications of social media use on well-being?

How can we disseminate information about social media's positive and negative impacts without having the latter obscure the former, given the

Figure 2. Social Media Intervention Research. At least three pathways exist for process-focused social media intervention research. Person-centered interventions focus on changing how people use social media to enhance well-being. Potential ways of communicating this information include instructing individuals directly, relaying information through parents, teachers, or supervisors, and the creation of institutional policies. Platform-centered interventions involve changing the way that social media platforms function (with user consent) to enhance their likelihood of promoting well-being. Finally, the person + platform intervention pathway involves the examination of the effects of both kinds of intervention simultaneously.

documented tendency for people to overweight negative (vs positive) information?

that the next 15 years will be ripe with discoveries that advance our understanding of how this ubiquitous technology influences our emotional lives.

References

1. Man, J. (2003) *The Gutenberg Revolution: The Story of a Genius and an Invention That Changed the World*, Gardners Books
2. Dewar, J.A. (1998) *The Information Age and the Printing Press: Looking Backward to See Ahead*, RAND Corporation
3. Boyd, D. and Ellison, N. (2007) Social network sites: definition, history, and scholarship. *J. Comput. Mediat. Commun.* 13, 210–230
4. Orben, A. and Przybylski, A.K. (2020) Reply to: Underestimating digital media harm. *Nat. Hum. Behav.* 4, 349–351
5. Twenge, J.M. *et al.* (2020) Underestimating digital media harm. *Nat. Hum. Behav.* 4, 346–348
6. Appel, M. *et al.* (2020) Are social media ruining our lives? A review of meta-analytic evidence. *Rev. Gen. Psychol.* 24, 60–74
7. Bayer, J.B. *et al.* (2020) Social media elements, ecologies, and effects. *Annu. Rev. Psychol.* 71, 471–497
8. Rains, S.A. and Brunner, S.R. (2014) What can we learn about social network sites by studying Facebook? A call and recommendations for research on social network sites. *New Media Soc.* 17, 114–131
9. Stoycheff, E. *et al.* (2017) What have we learned about social media by studying Facebook? A decade in review. *New Media Soc.* 19, 968–980
10. Wilson, R.E. *et al.* (2012) A review of Facebook research in the social sciences. *Perspect. Psychol. Sci.* 7, 203–220
11. Kross, E. *et al.* (2013) Facebook use predicts declines in subjective well-being in young adults. *PLoS One* 8, e69841
12. Verduyn, P. *et al.* (2017) Do social network sites enhance or undermine subjective well-being? A critical review. *Soc. Issues Policy Rev.* 11, 274–302
13. Shakya, H.B. and Christakis, N.A. (2017) Association of Facebook use with compromised well-being: a longitudinal study. *Am. J. Epidemiol.* 185, 203–211
14. Boers, E. *et al.* (2019) Association of screen time and depression in adolescence. *JAMA Pediatr.* 173, 853–859
15. Kim, H.H.-S. (2017) The impact of online social networking on adolescent psychological well-being (WB): a population-level analysis of Korean school-aged children. *Int. J. Adolesc. Youth* 22, 364–376
16. Viner, R.M. *et al.* (2019) Roles of cyberbullying, sleep, and physical activity in mediating the effects of social media use on mental health and wellbeing among young people in England: a secondary analysis of longitudinal data. *Lancet Child Adolesc. Health* 3, 685–696
17. Ferguson, C.J. *et al.* (2014) Concurrent and prospective analyses of peer, television and social media influences on body dissatisfaction, eating disorder symptoms and life satisfaction in adolescent girls. *J. Youth Adolesc.* 43, 1–14
18. Jensen, M. *et al.* (2019) Young adolescents' digital technology use and mental health symptoms: little evidence of longitudinal or daily linkages. *Clin. Psychol. Sci.* 7, 1416–1433
19. Coyne, S. *et al.* (2020) Does time spent using social media impact mental health? An eight year longitudinal study. *Comput. Hum. Behav.* 104, 106160
20. Orben, A. *et al.* (2019) Social media's enduring effect on adolescent life satisfaction. *Proc. Natl. Acad. Sci. U. S. A.* 116, 10226–10228
21. Heffer, T. *et al.* (2019) The longitudinal association between social-media use and depressive symptoms among adolescents and young adults: an empirical reply to Twenge *et al.* (2018). *Clin. Psychol. Sci.* 7, 462–470
22. Berryman, C. *et al.* (2018) Social media use and mental health among young adults. *Psychiatr. Q.* 89, 307–314

23. Kelly, Y. *et al.* (2018) Social media use and adolescent mental health: findings from the UK millennium cohort study. *EClinicalMedicine* 6, 59–68

24. Twenge, J.M. and Campbell, W.K. (2019) Media use is linked to lower psychological well-being: evidence from three datasets. *Psychiatr. Q.* 90, 311–331

25. Przybylski, A.K. and Weinstein, N. (2017) A large-scale test of the Goldilocks hypothesis: quantifying the relations between digital-screen use and the mental well-being of adolescents. *Psychol. Sci.* 28, 204–215

26. Ernala, S. *et al.* (2020) How well do people report time spent on Facebook? An evaluation of established survey questions with recommendations. In *Computing Systems: Proceedings of the 2020 CHI Conference on Human Factors*, pp. 1–4, Association for Computing Machinery

27. Allcott, H. *et al.* (2020) The welfare effects of social media. *Am. Econ. Rev.* 110, 629–676

28. Hunt, M.G. *et al.* (2018) No more FOMO: limiting social media decreases loneliness and depression. *J. Soc. Clin. Psychol.* 37, 751–768

29. Mosquera, R. *et al.* (2020) The economic effects of Facebook. *Exp. Econ.* 23, 575–602

30. Sagioglou, C. and Greitemeyer, T. (2014) Facebook's emotional consequences: why Facebook causes a decrease in mood and why people still use it. *Comput. Hum. Behav.* 35, 359–363

31. Tromholt, M. (2016) The Facebook experiment: quitting Facebook leads to higher levels of well-being. *Cyberpsychol. Behav. Soc. Netw.* 19, 661–666

32. Engeln, R. *et al.* (2020) Compared to Facebook, Instagram use causes more appearance comparison and lower body satisfaction in college women. *Body Image* 34, 38–45

33. Vanman, E.J. *et al.* (2018) The burden of online friends: the effects of giving up Facebook on stress and well-being. *J. Soc. Psychol.* 158, 496–508

34. Hall, J.A. *et al.* (2019) Experimentally manipulating social media abstinence: results of a four-week diary study. *Media Psychol.* Published online November 5, 2019. https://doi.org/10.1080/15213269.2019.1688171

35. Odgers, C.L. and Jensen, M.R. (2020) Annual research review: adolescent mental health in the digital age: facts, fears, and future directions. *J. Child Psychol. Psychiatry* 61, 336–348

36. Orben, A. (2020) Teenagers, screens and social media: a narrative review of reviews and key studies. *Soc. Psychiatry Psychiatr. Epidemiol.* 55, 407–414

37. Goffman, E. (1959) *The Presentation of Self in Everyday Life*, Doubleday

38. Leary, M.R. (2019) *Self-Presentation: Impression Management and Interpersonal Behavior*, Routledge

39. Festinger, L. (1954) A theory of social comparison processes. *Hum. Relat.* 7, 117–140

40. Halpern, D. *et al.* (2017) The online ideal persona vs. the jealousy effect: two explanations of why selfies are associated with lower-quality romantic relationships. *Telemat. Inform.* 34, 114–123

41. Chae, J. (2017) Virtual makeover: selfie-taking and social media use increase selfie-editing frequency through social comparison. *Comput. Hum. Behav.* 66, 370–376

42. Chua, T.H.H. and Chang, L. (2016) Follow me and like my beautiful selfies: Singapore teenage girls' engagement in self-presentation and peer comparison on social media. *Comput. Hum. Behav.* 55, 190–197

43. Vogel, E. and Rose, J. (2016) Self-reflection and interpersonal connection: making the most of self-presentation on social media. *Transl. Issues Psychol. Sci.* 2, 294–302

44. Gonzales, A.L. and Hancock, J.T. (2011) Mirror, mirror on my Facebook wall: effects of exposure to Facebook on self-esteem. *Cyberpsychol. Behav. Soc. Netw.* 14, 79–83

45. Gentile, B. *et al.* (2012) The effect of social networking websites on positive self-views: an experimental investigation. *Comput. Hum. Behav.* 28, 1929–1933

46. Toma, C.L. and Hancock, J.T. (2013) Self-affirmation underlies Facebook use. *Personal. Soc. Psychol. Bull.* 39, 321–331

47. Verduyn, P. *et al.* (2020) Social comparison on social networking sites. *Curr. Opin. Psychol.* 36, 32–37

48. Baldwin, M. and Mussweiler, T. (2018) The culture of social comparison. *Proc. Natl. Acad. Sci. U. S. A.* 115, E9067–E9074

49. Gilbert, P. *et al.* (1995) Social comparison, social attractiveness and evolution: how might they be related? *New Ideas Psychol.* 13, 149–165

50. Verduyn, P. *et al.* (2015) Passive Facebook usage undermines affective well-being: experimental and longitudinal evidence. *J. Exp. Psychol. Gen.* 144, 480–488

51. Tandoc Jr., E.C. *et al.* (2015) Facebook use, envy, and depression among college students: is Facebooking depressing? *Comput. Hum. Behav.* 43, 139–146

52. Ozimek, P. and Bierhoff, H.-W. (2020) All my online-friends are better than me – three studies about ability-based comparative social media use, self-esteem, and depressive tendencies. *Behav. Inf. Technol.* 39, 1110–1123

53. Krasnova, H. *et al.* (2015) Research note – why following friends can hurt you: an exploratory investigation of the effects of envy on social networking sites among college-age users. *Inf. Syst. Res.* 26, 585–605

54. Burnell, K. *et al.* (2019) Passive social networking site use and well-being: the mediating roles of social comparison and the fear of missing out. *Cyberpsychology (Brno)* 13, 5

55. Tiggemann, M. *et al.* (2018) The effect of Instagram "likes" on women's social comparison and body dissatisfaction. *Body Image* 26, 90–97

56. Hu, Y.-T. and Liu, Q.-Q. (2020) Passive social network site use and adolescent materialism: upward social comparison as a mediator. *Soc. Behav. Pers.* 48, e8833

57. Yuen, E.K. *et al.* (2019) The effects of Facebook on mood in emerging adults. *Psychol. Pop. Media Cult.* 8, 198–206

58. Albers, G. *et al.* (2019) Social media and depression symptoms: a network perspective. *J. Exp. Psychol. Gen.* 148, 1454–1462

59. Lin, R. and Utz, S. (2015) The emotional responses of browsing Facebook: happiness, envy, and the role of tie strength. *Comput. Hum. Behav.* 52, 29–38

60. Milyavskaya, M. *et al.* (2018) Fear of missing out: prevalence, dynamics, and consequences of experiencing FOMO. *Motiv. Emot.* 42, 725–737

61. Lukoff, K. *et al.* (2018) What makes smartphone use meaningful or meaningless? In *Interactive, Mobile, Wearable and Ubiquitous Technologies: Proceedings of the ACM*, pp. 22, Association for Computing Machinery

62. Rousseau, A. *et al.* (2017) The reciprocal and indirect relationships between passive Facebook use, comparison on Facebook, and adolescents' body dissatisfaction. *Comput. Hum. Behav.* 73, 336–344

63. Burke, M. *et al.* (2020) Social comparison and Facebook: feedback, positivity, and opportunities for comparison. In *Computing Systems: Proceedings of the 2020 CHI Conference on Human Factors*, pp. 1–13, Association for Computing Machinery

64. Feinstein, B.A. *et al.* (2013) Negative social comparison on Facebook and depressive symptoms: rumination as a mechanism. *Psychol. Pop. Media Cult.* 2, 161–170

65. Yang, C.C. *et al.* (2018) Social media social comparison of ability (but not opinion) predicts lower identity clarity: identity processing style as a mediator. *J. Youth Adolesc.* 47, 2114–2128

66. de Vries, D.A. and Kühne, R. (2015) Facebook and self-perception: individual susceptibility to negative social comparison on Facebook. *Pers. Individ. Dif.* 86, 217–221

67. de Vries, D.A. *et al.* (2018) Social comparison as the thief of joy: emotional consequences of viewing strangers' Instagram posts. *Media Psychol.* 21, 222–245

68. Vogel, E.A. *et al.* (2015) Who compares and despairs? The effect of social comparison orientation on social media use and its outcomes. *Pers. Individ. Dif.* 86, 249–256

69. Weinstein, E. (2017) Adolescents' differential responses to social media browsing: exploring causes and consequences for intervention. *Comput. Hum. Behav.* 76, 396–405

70. Liu, D. *et al.* (2019) Digital communication media use and psychological well-being: a meta-analysis. *J. Comput. Mediat. Commun.* 24, 259–273

71. Pempek, T.A. *et al.* (2009) College students' social networking experiences on Facebook. *J. Appl. Dev. Psychol.* 30, 227–238

72. Kahneman, D. and Tversky, A. (1979) Prospect theory: an analysis of decision under risk. *Econometrica* 47, 263–291

73. Baumeister, R.F. *et al.* (2001) Bad is stronger than good. *Rev. Gen. Psychol.* 5, 323–370

74. Rimé, B. (2009) Emotion elicits the social sharing of emotion: theory and empirical review. *Emot. Rev.* 1, 60–85

75. Brady, W.J. *et al.* (2020) The MAD model of moral contagion: the role of motivation, attention, and design in the spread of moralized content online. *Perspect. Psychol. Sci.* 15, 978–1010

76. Rimé, B. *et al.* (2019) Intrapersonal, interpersonal, and social outcomes of the social sharing of emotion. *Curr. Opin. Psychol.* 31, 127–134

77. Liu, D. *et al.* (2016) A meta-analysis of social networking online and social capital. *Rev. Gen. Psychol.* 20, 369–391

78. Liu, D. *et al.* (2018) A meta-analysis of social network site use and social support. *Comput. Educ.* 127, 201–213

79. Gilmour, J. *et al.* (2019) Facebook-based social support and health: a systematic review. *Psychol. Pop. Media Cult.* 9, 328–346

80. Starr, L.R. and Davila, J. (2008) Excessive reassurance seeking, depression, and interpersonal rejection: a meta-analytic review. *J. Abnorm. Psychol.* 117, 762–775

81. Park, J. *et al.* (2016) When perceptions defy reality: the relationships between depression and actual and perceived Facebook social support. *J. Affect. Disord.* 200, 37–44

82. Seo, M. *et al.* (2016) Frequent interaction and fast feedback predict perceived social support: using crawled and self-reported data of Facebook users. *J. Comput. Mediat. Commun.* 21, 282–297

83. Cohen, S. (2004) Social relationships and health. *Am. Psychol.* 59, 676–684

84. Helliwell, J. *et al.* (2016) *World Happiness Report*, Sustainable Development Solutions Network

85. Kowalski, R.M. *et al.* (2014) Bullying in the digital age: a critical review and meta-analysis of cyberbullying research among youth. *Psychol. Bull.* 140, 1073–1137

86. Cheng, J. *et al.* (2017) Anyone can become a troll: causes of trolling behavior in online discussions. In *CSCW: Proceedings of the Conference on Computer-Supported Cooperative Work*, pp. 1217–1230, Association for Computing Machinery

87. Hamm, M.P. *et al.* (2015) Prevalence and effect of cyberbullying on children and young people: a scoping review of social media studies. *JAMA Pediatr.* 169, 770–777

88. Watts, L. *et al.* (2017) Cyberbullying in higher education: a literature review. *Comput. Hum. Behav.* 69, 268–274

89. Whittaker, E. and Kowalski, R.M. (2015) Cyberbullying via social media. *J. Sch. Violence* 14, 11–29

90. Buckels, E.E. *et al.* (2019) Internet trolling and everyday sadism: parallel effects on pain perception and moral judgment. *J. Pers.* 87, 328–340

91. Suler, J. (2004) The online disinhibition effect. *CyberPsychol. Behav.* 7, 321–326

92. Lieberman, A. and Schroeder, J. (2020) Two social lives: how differences between online and offline interaction influence social outcomes. *Curr. Opin. Psychol.* 31, 16–21

93. de Waal, F.B.M. and Preston, S.D. (2017) Mammalian empathy: behavioural manifestations and neural basis. *Nat. Rev. Neurosci.* 18, 498–509

94. Lapidot-Lefler, N. and Barak, A. (2012) Effects of anonymity, invisibility, and lack of eye-contact on toxic online disinhibition. *Comput. Hum. Behav.* 28, 434–443

95. Runions, K.C. and Bak, M. (2015) Online moral disengagement, cyberbullying, and cyber-aggression. *Cyberpsychol. Behav. Soc. Netw.* 18, 400–405

96. Verduyn, P. *et al.* (2015) Determinants of emotion duration and underlying psychological and neural mechanisms. *Emot. Rev.* 7, 330–335

97. Crockett, M.J. (2017) Moral outrage in the digital age. *Nat. Hum. Behav.* 1, 769–771

98. Mooijman, M. *et al.* (2018) Moralization in social networks and the emergence of violence during protests. *Nat. Hum. Behav.* 2, 389–396

99. Brady, W.J. *et al.* (2017) Emotion shapes the diffusion of moralized content in social networks. *Proc. Natl Acad. Sci. U. S. A.* 114, 7313–7318

100. Haslam, N. and Loughnan, S. (2014) Dehumanization and infrahumanization. *Annu. Rev. Psychol.* 65, 399–423

101. Brady, W.J. and Crockett, M.J. (2019) How effective is online outrage? *Trends Cogn. Sci.* 23, 79–80

102. Turel, O. and Qahri-Saremi, H. (2018) Explaining unplanned online media behaviors: dual system theory models of impulsive use and swearing on social networking sites. *New Media Soc.* 20, 3050–3067

103. Kramer, A.D.I. *et al.* (2014) Experimental evidence of massive-scale emotional contagion through social networks. *Proc. Natl. Acad. Sci. U. S. A.* 111, 8788–8790

104. Kross, E. *et al.* (2019) Does counting emotion words on online social networks provide a window into people's subjective experience of emotion? A case study on Facebook. *Emotion* 19, 97–107

105. Page, S.E. (2017) *The Diversity Bonus: How Great Teams Pay Off in the Knowledge Economy*, Princeton University Press

106. Kelley, T.L. (1927) *Interpretation of Educational Measurements*, World Book Company

107. Thorndike, E.L. (1904) *An Introduction to the Theory of Mental and Social Measurements*, Teachers College, Columbia University

108. Ellison, N.B. and Boyd, D. (2013) Sociality through social network sites. In *The Oxford Handbook of Internet Studies* (Dutton, W.H., ed.), pp. 151–172, Oxford University Press

109. Meier, A. (2020) Computer-mediated communication, social media, and mental health: a conceptual and empirical meta-review. *PsyArXiv Preprints* Published online April 6, 2020. https://doi.org/10.31234/osf.io/573ph

110. Huang, C. (2017) Time spent on social network sites and psychological well-being: a meta-analysis. *Cyberpsychol. Behav. Soc. Netw.* 20, 346–354

111. Song, H. *et al.* (2014) Does Facebook make you lonely? A meta analysis. *Comput. Hum. Behav.* 36, 446–452

112. Yoon, S. *et al.* (2019) Is social network site usage related to depression? A meta-analysis of Facebook–depression relations. *J. Affect. Disord.* 248, 65–72

113. Neel, R. *et al.* (2016) Individual differences in fundamental social motives. *J. Pers. Soc. Psychol.* 110, 887–907

114. Kruglanski, A.W. *et al.* (2013) Features of multifinality. *Personal. Soc. Psychol. Rev.* 17, 22–39