

Chapman University

## Chapman University Digital Commons

---

Communication Faculty Articles and Research

School of Communication

---

2-10-2023

### Digital Flourishing: Conceptualizing and Assessing Positive Perceptions of Mediated Social Interactions

Sophie H. Janicke-Bowles

Tess M. Buckley

Rikishi T. Rey

Tayah Renea Wozniak

Adrian Meier

*See next page for additional authors*

Follow this and additional works at: [https://digitalcommons.chapman.edu/comm\\_articles](https://digitalcommons.chapman.edu/comm_articles)



Part of the [Communication Technology and New Media Commons](#), and the [Social Media Commons](#)

---

---

# Digital Flourishing: Conceptualizing and Assessing Positive Perceptions of Mediated Social Interactions

## Comments

This article was originally published in *Journal of Happiness Studies* in 2023. <https://doi.org/10.1007/s10902-023-00619-5>

## Creative Commons License



This work is licensed under a [Creative Commons Attribution 4.0 License](https://creativecommons.org/licenses/by/4.0/).

## Copyright

The authors

## Authors

Sophie H. Janicke-Bowles, Tess M. Buckley, Rikishi T. Rey, Tayah Renea Wozniak, Adrian Meier, and Anna Lomanowska



# Digital Flourishing: Conceptualizing and Assessing Positive Perceptions of Mediated Social Interactions

Sophie H. Janicke-Bowles<sup>1</sup> · Tess M. Buckley<sup>1</sup> · Rikishi Rey<sup>2</sup> · Tayah Wozniak<sup>3</sup> · Adrian Meier<sup>4</sup> · Anna Lomanowska<sup>5</sup>

Accepted: 30 December 2022

© The Author(s) 2023

## Abstract

Recent research started to apply concepts of well-being to the context of computer mediated communication (e.g., social media, instant messaging). While much research investigates negative perceptions of mediated social interactions (e.g., “problematic” or “addictive” social media use), a multi-dimensional measure that taps into users’ positive perceptions is sorely lacking. The present research therefore develops the first comprehensive measure of *digital flourishing*, defined as positive perceptions of mediated social interactions. Building on a qualitative pre-study that aided the construction of the Digital Flourishing Scale (DFS), Study 1 ( $N = 474$ ) employed exploratory factor analysis to reveal five subdimensions of digital flourishing. The preregistered Study 2 ( $N = 438$ ) confirmed these five dimensions, yielding five reliable items per subscale and initial construct validity with three psychological needs from self-determination theory (SDT; competence, autonomy, relatedness) which were used as an underlying well-being framework for the development of the DFS. The preregistered Study 3 generated further construct validity by directly relating DFS to well-being. The scale is relevant for researchers and practitioners alike to better understand how users perceive their mediated interactions to impact mental health and well-being.

**Keywords** Computer mediated communication (CMC) · Well-being · Flourishing · Scale development · Self-determination theory

The interplay between digital communication via social media or smartphones and users’ well-being has recently received considerable research attention (Meier & Reinecke, 2021; Orben, 2020). Much work in this area relies on self-report instruments that assess users’ *negative perceptions* of digital technology effects, including problematic internet, social media, or mobile use (e.g., Kwon et al., 2013), fear of missing out (FOMO; Przybylski et al., 2013), or digital stress (Hall et al., 2021), to name but a few. Yet, evidence on users’ *positive perceptions* is much more limited. Several studies do measure positive perceptions of technology effects on well-being, but they mostly rely on narrow concepts such as inspiration (Meier et al., 2020), interactions with positive content (Schreurs & Vandenbosch, 2021), or

---

Extended author information available on the last page of the article

social capital and support on social media (Nick et al., 2018). Accordingly, while countless multi-dimensional instruments try to identify the users that—justifiably or not—perceive themselves to experience harms from digital technology use, the field lacks a comprehensive and validated measure that investigates users’ *digital flourishing*, that is, their multi-faceted perceptions of positive online experiences and behaviors.

Crucially, such a measure—like its negative counterparts—should not be interpreted to tell us much about the *actual* effects of digital technologies on well-being. Negative and positive perceptions may result from numerous sources, such as (biased) self- and other-perceptions, peer or parental influence, or societal discourse. However, such a measure would allow us to better understand (a) on which dimensions users perceive benefits from digital technologies (i.e., *what?*), (b) the average levels of these perceptions (i.e., *how much?*), and (c) differential susceptibility to these perceptions (i.e., *who?*). Moreover, these perceptions may be relevant for users’ intentions to continue engaging with technology or their support of “digital well-being” interventions and policy. In the present study, we address this crucial gap by conceptualizing and operationalizing a measure that identifies users who report to flourish in/from mediated social interactions—the *Digital Flourishing Scale* (DFS).

Existing measures of perceived digital technology effects are conceptually limited in an additional way: they predominantly focus on channels (Meier & Reinecke, 2021). That is, scales typically measure users’ perceptions of a particular device (e.g., smartphone), application (e.g., social media, email), or feature (e.g., status update, private messenger). This severely limits their generalizability and requires constant (re-)invention of self-report scales once the predominant communication technologies—the channels—inevitably change (Bayer et al., 2020). Here, we apply a communication-centered approach and instead focus on a level of analysis that generalizes to mediated behavior via various devices, applications, and features (Meier & Reinecke, 2021). By tapping into users’ positive perceptions of mediated *interactions*, rather than specific devices or applications, the present contribution reframes how we can study perceived communication technology effects. This approach allows us to measure positive perceptions across various technological channels, which makes the scale more generalizable and more applicable in the future.

In the following, drawing on self-determination theory (SDT), we first define digital flourishing conceptually and outline its six central facets. In a series of three studies, we then develop a first version of the *Digital Flourishing Scale* (DFS), analyze its psychometric properties, and investigate its relationships with the three basic psychological needs (autonomy, competence, relatedness) from SDT to examine construct validity. Our discussion focuses on how the DFS will further our understanding of mediated interactions, social media, and their perceived effects on well-being. Specifically, we give recommendations for how the scale might be used in future research designs.

## 1 Digital Flourishing Defined

Central to our understanding of digital flourishing is the notion of *mediated social interaction*, also termed *computer-mediated communication* (CMC). CMC is defined as “an inclusive umbrella term for multimodal human-to-human social interaction mediated by information and communication technologies (ICT’s)” (Meier & Reinecke, 2021, p. 1183–1184; see also Bayer et al., 2020). In today’s social media landscape, such mediated social

interaction includes interpersonal and masspersonal “active” communication (e.g., instant messaging, posting status updates) as well as more “passive” social attention (e.g., browsing through social media) (O’Sullivan & Carr, 2018). Research has converged on the preliminary conclusion that effects of social media on well-being depend strongly on the interactional qualities of its use, specifically whether use entails more “active” communicative or rather “passive” consumptive elements of social interaction (e.g., Dienlin & Johannes 2020; Verduyn et al., 2017). Scholars have recently begun to advocate for research that looks beyond the effects of “active” and “passive” media consumption and instead focuses on how users process the content they create and consume (Kross et al., 2020). Given this centrality of mediated social interaction for well-being—rather than the mere “screen time” or other channel-related aspects (Orben, 2020)—we focus on the interaction level to arrive at a definition of digital flourishing.

Since our goal is to provide researchers with a concept and scale that specifically taps into the positive rather than the negative perceptions of mediated interactions, we also concentrate on the positive side of mental health, termed well-being or flourishing. *Flourishing* (see also Seligman 2011; Przybylko et al., 2021) was first conceptualized in positive psychology and is understood as both, “feeling well” and “doing well”. The former is generally operationalized as *subjective well-being* (Diener, 1984) involving high positive affect, low negative affect, and high life satisfaction. The latter, in turn, is related to *eudaimonic well-being* (e.g., Ryff 1989), which is understood as virtuous behaviors that are geared toward self-actualization. There is no one conceptualization of this more long-term, eudaimonic conceptualization of living the good life, but common facets involve, inter alia, purpose/meaning, self-actualization, authenticity, environmental mastery, connectedness, and accomplishment (Martela & Sheldon, 2019). Flourishing thus comprises all aspects of well-being, fleeting or lasting, on an experiential as well as a behavioral or functional level (Huta & Waterman, 2014). On a construct level for our scale, these aspects of flourishing are included as individual’s perceptions of their experiences (feeling well) and behaviors (doing well) in relation to mediated social interactions. Thus, we define digital flourishing as *positive perceptions of an individual’s experiences and behaviors in mediated social interactions*.

## 1.1 Explicating Digital Flourishing

Which positive perceptions of mediated interactions may be central to users’ engagement with technology and their well-being? In a recent integrative review, Martela & Sheldon (2019) argue that the satisfaction of three basic psychological needs (i.e., competence, relatedness, and autonomy) as exemplified in self-determination theory (SDT; Deci & Ryan 2000), is a key mechanism leading to both short-term hedonic and long-term eudaimonic well-being. Therefore, we use SDT as a theoretical *organizing framework* to identify and map core facets of digital flourishing. This approach allows us to capture several key benefits that users perceive from mediated interactions in a parsimonious but still comprehensive way.

According to SDT, humans are innately striving to be self-determined. Individuals are intrinsically motivated to act in the world because doing so will satisfy their basic psychological needs, which are essential for short-term well-being and long-term growth (Deci & Ryan, 2000). At its core, the basic psychological need theory, a sub-theory of SDT, proposes

that the needs for competence, relatedness, and autonomy are universally sought out to be satisfied. *Autonomy* refers to having a sense of control, volition, or freedom when engaging in an activity; *competence* is related to perceiving oneself to be effective in manipulating the environment in a way that results in valued outcomes; and *relatedness* involves a sense of connection, care toward others, and feeling cared for by others (Deci & Ryan, 2000).

Based on a recent comprehensive review of the literature concerned with effects of social media and CMC on well-being (see the 34 reviews included in Meier & Reinecke 2021), we suggest there are six major dimensions on which users perceive digital flourishing. These map onto the three psychological needs exemplified by SDT: First, the need for *competence* can be satisfied by (a) knowing how to best self-present and self-disclose to others online in a way that is authentic and fits the context, (b) socially comparing in a way that leads to inspiration rather than malicious envy, and (c) engaging in civil discourse. Second, the need for *relatedness* can be satisfied by (d) feeling connected to close and distant others online and (e) experiencing social support and gaining social capital from mediated social interactions. Third, the need for *autonomy* can be satisfied by (f) having a sense of control of how to deal with mediated social interactions in everyday life.

The main assumption behind these six dimensions is that *how* users interact in mediated settings is crucial to explain their perceptions of positive or negative well-being effects of CMC. Research about “active” vs. “passive” social media use, for instance, often assumes that active forms of mediated social interactions are generally more beneficial for well-being, while passive forms are supposedly detrimental (Dienlin & Johannes, 2020; Verduyn et al., 2017). However, this dichotomy is increasingly being questioned (e.g., Kross et al., 2020; Meier et al., 2020). Instead, our approach to mediated interactions aims to be more nuanced and thus includes positive perceptions of both “active” (i.e., sending) and “passive” (i.e., receiving) elements of mediated interactions. In the following, we briefly explicate alongside the three SDT needs each digital flourishing dimension. That is, on which aspects of mediated social interaction users may perceive potential benefits from technology engagement.

### 1.1.1 Competence-Enhancing Perceptions in Mediated Interactions

The first flourishing dimension clustered under the need for competence is *authentic self-disclosure* in mediated interactions. Sharing personal information without pretense or manipulation of one’s self-presentation (i.e., authentically) has been shown to positively impact self-esteem, online-relationships, life satisfaction, and well-being (Luo & Hancock, 2020). Successfully navigating the intricacies of online self-presentation and public self-disclosure in ways that feel authentic should be particularly relevant to one’s self-efficacy in and knowledge of digital environments and cultures. That is, knowing how much and what to disclose, and in which digital contexts, should be a key competence-enhancing perception in mediated interactions.

The second flourishing dimension, social comparison, is an important behavior linked to both negative and positive well-being effects of social media (e.g., Meier et al., 2020; Verduyn et al., 2020). Specifically, *positive social comparison* during “passive” use has been related to higher inspiration, motivation, and an overall positive state of well-being (Meier et al., 2020). These positive effects are the result of upward social comparison, which facilitates inspiration and motivation when the information being processed leads to feelings

of self-improvement (Meier et al., 2020). Thus, successfully arranging one's online social environment in ways that decrease negative and increase positive social comparisons (e.g., following accounts or personas that are perceived as inspiring), and thus perceiving mediated social comparisons to be mainly positive, should be another perception that enhances competence in mediated interactions.

The third flourishing dimension can be found by focusing on the civility of online discourse. Uncivil discourse—using unnecessarily disrespectful tone and language (Coe et al., 2014)—has been shown to decrease trust between interaction partners and increase disruption, insult, and discouragement to continue online discourse in the future (Stromer-Galley & Wichowski, 2010; see also Stevens et al., 2021). In contrast, engaging in responsible, mindful, and *civil participation*, especially in public social media use and comment sections, may represent an important but understudied link between mediated interactions and well-being (e.g., Sabatini & Sarracino 2017). Civil participation refers to civil and open communication that is polite, considerate, based on reason, reciprocity, and can involve discourse with others who hold a differing viewpoint (e.g., Ferriss 2002). Knowing how to direct and restrain one's online communication in a way that supports and promotes civil discourse should provide a sense of competence in effectively interacting with others online.

### 1.1.2 Relatedness-Enhancing Perceptions in Mediated Interactions

As the fourth and fifth flourishing dimensions, we identify two strong positive links between mediated interactions and well-being alongside the SDT need for relatedness: social connectedness and social support/capital (Meier & Reinecke, 2021). *Social connectedness* is conceptualized as a person's sense of closeness to their social world rooted in feelings of belonging and meaningfulness in interpersonal interactions with others (Ryan & Deci, 2000). Meta-analyses demonstrate that purposeful and meaningful ways of connecting with others online (i.e., private messages, commenting) are linked to increased life satisfaction and well-being as well as decreased loneliness, depression, and anxiety (Domahidi, 2018; Liu et al., 2019). Thus, actively engaging in and maintaining relationships and conversations with others online should intensify the perception of social connection and thereby enhance relatedness.

Furthermore, over the last two decades, various studies have demonstrated that social network sites (SNS) are an especially potent means for accessing *social capital and support* (Domahidi, 2018). Studies of online support groups have further shown various benefits of supportive online interactions for individuals experiencing physical and mental health concerns (e.g., Worrall et al., 2018) or other issues (e.g., Ybarra et al., 2015). In CMC in general, a user's perceived social support has been positively associated with well-being (Domahidi, 2018; Liu et al., 2019). Naturally, perceiving that one can rely on a network online which provides support in times of need should clearly enhance relatedness perceptions.

### 1.1.3 Autonomy-Enhancing Perceptions in Mediated Interactions

As the final flourishing dimension, users' perceived *self-control* over mediated interactions corresponds with the SDT need for autonomy. Research shows that being continuously connected to one's network via smartphones and social media can challenge an individual's capacity for self-control, sometimes leading to conflicts between mediated interactions and

other activities (e.g., driving a car, talking face-to-face; Hofmann et al., 2017). Thus, perceiving high levels of self-control over and mindful engagement with mediated interactions should be an important additional dimension. For example, research suggests users' self-control is negatively related to perceptions of "technology addiction" or procrastination with social media (Reinecke & Meier, 2021). In contrast, moderate smartphone use in adolescents is positively related to their well-being, while low and very high use are negatively related (Przybylski & Weinstein, 2017). These findings suggest that perceiving mediated interactions to be a self-controlled and mindful behavior should enhance users' autonomy.

## 2 The Present Research

The goal of the present research was to create a reliable and valid digital flourishing scale that comprehensively measures the previously identified six dimensions, using SDT as an underlying framework that organizes people's positive perceptions of mediated social interactions (Deci & Ryan, 2000). To this end, a series of three studies was conducted to establish, test, and confirm relevant items, factor structure, and dimensions of digital flourishing. In doing so, we followed the methodological standards of scale development (Carpenter, 2018).

In a first step, we perused existing scales that (a) measured facets like those identified above, (b) would fit within our umbrella of self-determination theory, and (c) focused on mediated social interactions (see supplement A in OSF). Next, to investigate the face validity of our a priori conceptualization of digital flourishing (see above), we conducted semi-structured focus groups. Based on the results of this pre-study, items were adjusted and complemented to finalize our first item pool of 120 items (i.e., 20 items per dimension). The goal of Study 1 was to explore psychometric properties and model the structure of these 120 initial digital flourishing items, using exploratory factor analysis (EFA) techniques. The goals of Study 2 were to confirm the factor structure using confirmatory factor analyses (CFA), investigate competing factor solutions, and conduct an initial test of convergent validity with the three SDT needs as outlined above.

### 2.1 Pre-Study

#### 2.1.1 Method

We conducted six focus groups among young adults who frequently communicate online via different channels ( $N=19$ ;  $M_{\text{age}} = 20.53$ ,  $SD_{\text{age}} = 2.24$ , 84.2% female) to investigate our proposed six-dimensional structure of digital flourishing. Specifically, we sought to check whether we missed any additional dimensions and explore what young adults understand as digital flourishing. Participants were recruited via a university's subject pool and received a nominal amount of research credit for their one-hour long participation. Focus groups were conducted via Zoom over the course of three weeks and included up to four participants at once. Two members of the research team moderated the discussions which were guided by five main research questions (e.g., "How would you define digital flourishing? In what ways does digital media influence your relationships?"; see supplemental B in OSF).



## 2.1.2 Analysis and Results

Based on a thematic analysis, several themes emerged, which overall supported our initial understanding of digital flourishing and proposed subdimensions. When we asked participants to tell us what they understand as digital flourishing they noted that it is a way to use technology in ways that benefit our and other people's lives. These perceived benefits pertained, *inter alia*, to relationship management (private and business), social connection, inspiration, learning, self-expression, efficiency, entertainment, and personal accomplishment. In short, digital flourishing is seen in lay terms as a conglomeration of all the benefits people can perceive as resulting from digital communication technology use, particularly social media. Participants also stated that the technologies or applications they use are not inherently "bad" but that their perceptions of positive or negative effects depend on how these applications are used. This observation aligns with our more nuanced focus on mediated interactions rather than global judgements about digital technologies *per se*.

Related to our subdimensions of digital flourishing, first, *authentic self-disclosure* did emerge as a theme, even though not as frequently as the other topics. One person stated that "posting to show others what [she is] up to makes [her] feel happy," and another person said that in her private story on Snapchat she does portray more of "herself," which makes her feel better. Second, themes related to *social comparison* were mentioned by several participants specifically in relation to the negative effects of Instagram as it features "people projecting false realities" and instigates negative comparison ("looking at other people's profiles"). At the same time participants also stated inspiration to be a common experience and social media as an outlet for artistic expression, supporting the research on positive effects of social comparison. For example, one participant said, "Social media has changed to positive body images, plus more art, so I focus on appreciating what others are doing instead of an obsession."

Third, some participants mentioned how they see a lot of "fighting on Facebook over politics," which speaks to the problem of incivility online, a facet we address in our *civil participation* subscale. Related to this, one participant also mentioned how they "speak out for the little guy, but sometimes a little too direct," and another talked about how they use digital media "without thinking" (which they perceived as problematic), further highlighting how civil participation could satisfy competence needs by knowing how to speak up online.

With respect to *social connectedness and support*, participants stated that mediated interactions are great ways to stay connected and feel supported daily. For example, one participant said they use Instagram to let those who they are less close to know they are thinking about them. In addition, participants used multiple channels such as Facetime, calls, or texts to stay in touch with their families, a finding also mirrored by quantitative studies (e.g., Choi & Toma, 2014).

On the other hand, participants also mentioned how they feel pressured to constantly connect and feel worse when they spend excessive amounts of time on their phones, speaking to the importance of *self-control* over mediated interactions. For example, several participants said that their day feels less productive, and they feel more anxious when they spend more time on their phone.

Another theme mentioned by participants but not included in our original six dimensions was the fear of missing out (FOMO) (e.g., "I have FOMO when I see what my friends are

doing on SM without me”). However, a reliable scale for FOMO already exists (Przybylski et al., 2013) and it goes beyond our narrower focus on the positive side of mediated interactions. Additionally, participants mentioned the positive effects of entertainment that users derive from digital technologies. Since entertainment is typically the result of content exposure or gaming rather than mediated social interactions, we did not add this component to our scale.

### 2.1.3 Conclusion

The focus groups provided initial validation of our proposed six-dimensional structure of digital flourishing as well as further inspiration for item pool generation. Based on the results, the research team iteratively adjusted item wording. Finally, another expert in the field of media psychology who was not involved in the previous item pool generation provided feedback on item wording, validity, and overall dimensional structure. After a final round of item revisions, the initial item pool was employed in a first exploratory survey.

## 2.2 Study 1

Our goal was to create a digital flourishing measure with five to six items per dimension. Thus, as recommended in the literature (Hartmann & Reinecke, 2013), we initially generated 1.5 times as many items per dimension. Negatively worded items were constructed to reduce response biases (e.g., Podsakoff et al., 2003). Our final item pool consisted of 120 items, 20 items for each subscale, with a total of 41 negatively worded items that were roughly equally distributed between each scale. The goal of Study 1 was to explore psychometric properties and model the structure of these 120 initial digital flourishing items using exploratory factor analysis (EFA) techniques.

## 2.3 Method

### 2.3.1 Sample

To examine our initial pool of 120 items, we conducted an online survey using Qualtrics. We drew a sample of 586 adults aged 18–49, since this age-group is interacting the most online (Pew Research Center, 2021). Participants who did not answer an attention check correctly were excluded by Qualtrics beforehand. Of the 586,  $n=106$  provided only partial responses with more than 50% of missing cases and were therefore not included in the final analysis (Carpenter, 2018). Participants who took the survey faster than 6.83 min were excluded ( $n=2$ ). This was half the median of the response time required by participants in a small pretest ( $N=44$ ). We further conducted an outlier analysis among the remaining 478 participants' responses to all 120 flourishing items. Outliers were inspected based on the boxplots. Four outliers with values of three times the Inter Quartile Range (IQR) beyond the first and third quartiles, and that appeared on more than one item in the analysis, were removed from the sample. Thus, the final sample consisted of  $N=474$  participants, who took about 21 min to complete the survey ( $SD=14.78$ ,  $Min=6.87$ ,  $Max=131.52$ ,  $Median=16.71$ ). The item-to-responder ratio for the final sample size and the full 120 item scale was about 1:4.

The final sample is representative of the U.S. population concerning gender, ethnicity, and income. Of the sample, 49.6% identified as female and the average age was 32.41 years ( $SD=7.81$ ,  $Min=18$ ,  $Max=49$ ). A detailed description of the sample can be found in OSF. On average, participants spent 6.17 h communicating online on a typical day ( $SD=3.41$ ,  $Min=1$  h,  $Max=13$  h;  $N=432$ ), including both professional and personal communication (e.g., email, texting, direct messaging, interacting on social media, phone conversations, video chat).

### 2.3.2 Procedure

After giving informed consent (IRB#21–13), participants provided the above-mentioned demographic information, time spent communicating online, and then answered the 120 digital flourishing items. Items were presented in blocks based on the three basic needs to alleviate strain for participants. Within each block, items were randomized to reduce carry-over effects or response sets. Participants answered all items on a 7-point Likert-scale from 1=strongly disagree to 7=strongly agree. Supplement C in OSF outlines the instructions and initial item pool used in Study 1.

## 2.4 Analytical Procedure

### 2.4.1 Psychometrics and Initial Item Reduction

We initially investigated the distribution of items by looking at their  $M$ ,  $SD$ , and skewness and kurtosis values as well as Kolmogorov-Smirnov tests using SPSS 26. The Kolmogorov-Smirnov tests revealed significant non-normal distributions for all items. However, for most items, skewness and kurtosis were not above or below the common threshold of  $\pm 1$  (Hair et al., 2017). Additionally, item difficulty, which refers to the ease with which a participant agrees with an item, was calculated (Hartmann & Reinecke, 2013). Items that were too easy ( $>0.80$ ) or too hard ( $>0.20$ ) were eliminated ( $k=8$ ), leaving  $k=112$  items for the subsequent EFA (see Supplement D in OSF).

### 2.4.2 Exploratory Factor Analysis

An EFA via SPSS 26 with Principal Axis Factoring (PAF) using promax rotation ( $Kappa=4$ ) was conducted since the six digital flourishing dimensions were not expected to be completely independent from each other. Factor retention was determined based on the inspection of the scree-plot and a parallel analysis (Carpenter, 2018). Additional criteria for item inclusion were that the item loaded on its primary factor with at least  $|0.40|$  and cross-loaded less than  $|0.30|$ , while at the same time demonstrating a difference of at least 0.20 between the primary and cross-loading factor (Howard, 2016). Furthermore, factors were only retained if they had at least three items loading above  $|0.40|$  (Carpenter, 2018).

## 2.5 Results

The EFA of the remaining 112 items ( $N=474$ ) revealed sufficient sampling adequacy with  $KMO=0.947$  and a significant Bartlett's Test of Sphericity (Approx.  $\chi^2(6216)=30796.96$ ,

$p < .001$ ). The initial factor solution found 19 factors with Eigenvalues above 1, explaining 53.35% of variance. The scree-plot suggested a dip after 4–5 factors. The parallel analysis showed that all 19 factors had greater Eigenvalues than the ones indicated by a random sample, thus not further indicating to reduce the factor structure. After inspecting the pattern matrix of the 19-factor solution it became apparent that all negatively worded items loaded together on one factor, creating a common method factor (Podsakoff et al., 2003). As this result indicated a systematic method variance rather than a substantially interpretable factor, we deleted all negatively worded items. Beyond increasing the chance of obtaining a substantially meaningful factor solution, retaining only the positive items also fits with our overall goal of measuring flourishing (rather than languishing) in mediated social interactions.

After eliminating the negatively worded items, another PAF and parallel analysis was conducted. The PAF with 71 items indicated to extract 11 factors with Eigenvalues above 1, which would explain 50.1% of variance. The scree-plot again suggested a dip at the 4–5 factor mark. The parallel analysis did not suggest that fewer than 11 factors should be retained. Consequently, we inspected the pattern matrix of the 11-factor solution and all items that loaded below 0.40 on any factor or cross-loaded significantly were iteratively deleted (see Supplement E in OSF for step-by-step results of the PAF).

The EFA ultimately led to a five-factor model explaining 46.53% of variance with a total of 47 items. The first factor represented a combination of our previously separately conceptualized factors of social connection and social support and included 19 items. We now refer to this factor simply as *Connectedness* ( $\alpha = 0.950$ ;  $M = 5.28$ ,  $SD = 1.05$ ). The second factor represented *Self-Control* (11 items;  $\alpha = 0.875$ ;  $M = 5.38$ ,  $SD = 0.937$ ), the third factor *Civil Participation* (7 items;  $\alpha = 0.814$ ;  $M = 5.69$ ,  $SD = 0.867$ ), the fourth factor *Positive Social Comparison* (6 items<sup>1</sup>;  $\alpha = 0.782$ ;  $M = 0.494$ ,  $SD = 1.17$ ), and the fifth factor represented *Authentic Self-Disclosure* (4 items;  $\alpha = 0.728$ ;  $M = 5.03$ ,  $SD = 1.22$ ). Factor correlations ranged between  $r = .30$  to  $0.65$ , indicating that the subscales did indeed measure distinct facets of digital flourishing (see Supplement F in OSF for factor loading and correlations table).

## 2.6 Discussion

The results of Study 1 provide preliminary support for five distinct dimensions of digital flourishing. Even though we conceptually differentiated between perceived social connectedness and social support, empirically these two constructs were very closely aligned. Given the theoretical overlap between connectedness and support (Nick et al., 2018), we found it reasonable to combine the two in one factor and continued to do so in Study 2. The five dimensions also had satisfactory internal consistencies. However, the scale still contained too many items ( $k = 47$ ) and different numbers of items per subscale, making it impractical for most studies. Furthermore, the factor structure needed to be replicated and alternative factor solutions tested. Consequently, we conducted a confirmatory Study 2.

<sup>1</sup> One of the items was kept in the positive social comparison scale even though it loaded below 0.4 on the factor, to retain enough items per scale.

## 2.7 Study 2

The goals of the pre-registered Study 2 (variables, sampling, and analysis plan; see OSF), were, first, to further reduce and equalize the number of items to five per subscale, confirm the proposed factor structure, investigate competing factor models (i.e., unidimensional, multidimensional, higher order). Second, we sought to test correlations between the digital flourishing dimensions with the satisfaction of three basic psychological needs (i.e., autonomy, competence, relatedness) for an initial test of construct validity. Additionally, extending Study 1, we used a sample from the general population of US Internet users to examine the scale's validity among all age groups. For each subscale, we selected the seven items with the highest loadings on their respective factor, resulting in 35 items in total. Where fewer than seven items remained for a factor in Study 1, we added one new item and revised four items based on our initial item pool (see Supplement G in OSF for items used in Study 2).

## 2.8 Method

### 2.8.1 Sample and Procedure

For Study 2, we collected an initial sample of 445 participants using the Prolific panel ([www.prolific.co](http://www.prolific.co)). After giving informed consent, participants reported key demographic characteristics (age, gender, ethnicity, income, degree), how much time on an average day they spend communicating online (professionally and privately), and then answered the 35 digital flourishing items, followed by 21 items of the psychological need satisfaction scale (Deci & Ryan, 2000). All subscales yielded good internal consistencies (autonomy, 7 items:  $\alpha = 0.806$ ;  $M=5.33$ ,  $SD=1.05$ ; relatedness, 8 items:  $\alpha = 0.825$ ;  $M=5.25$ ,  $SD=0.962$ ; competence, 6 items:  $\alpha = 0.801$ ;  $M=5.04$ ,  $SD=1.17$ ). The digital flourishing and need satisfaction items were presented in separate blocks, in random order within each block, and answered on a seven-point Likert-scale ranging from 1=strongly disagree to 7=strongly agree.

Five participants had over 50% of missing data and were thus removed. All remaining  $N=440$  participants completed attention check items successfully. To eliminate too fast responses, we set a threshold of 3.22 min. This is the product of the minimum time it took participants to take Study 1 multiplied by 47%, which represents the overall number of items in Study 2 compared to Study 1 ( $6.87 * 0.47=3.22$ ). Three participants completed the questionnaire faster than this threshold and were consequently eliminated from the analysis. We again conducted a boxplot outlier analysis on all flourishing items, which revealed two cases that appeared more than once with values over three IQR above the third quartile. These were consequently deleted, leaving a total of  $N=435$  participants.

On average, participants took 9.12 min to complete the survey ( $SD=4.95$ ,  $Median=7.8$ ,  $Min=3.26$ ,  $Max=35.62$ ). In the final sample, the average age was 44.85 years ( $SD=15.80$ ,  $Min=18$ ,  $Max=79$ ) and half of the sample (50.3%) identified as female. Overall, the sample was representative for U.S. Americans on gender, and mostly on ethnicity (Whites were slightly overrepresented; Hispanic/Latino underrepresented). In terms of age, the sample was slightly older than the national average (U.S. population median age=37.2) and the sample was slightly more educated than the U.S. average (U.S. Census Bureau, 2020). On

average, participants indicated that they spent 4.13 h communicating online, including professional and personal communication ( $SD=2.98$ ,  $Min=1$  h,  $Max=13$  h;  $N=435$ ). See OSF for a detailed sample description.

## 2.9 Analysis and Results

### 2.9.1 Psychometrics and Initial Item Reduction

Kolmogorov-Smirnov tests were significant for all items ( $p<.05$ ), again indicating non-normal distributions, yet for most items the skewness and kurtosis values were within the acceptable range of  $\pm 1$ . Calculating item difficulty revealed four items that were too easy ( $>0.80$ ). Because the goal was to reduce items for each scale by two, we used this step for an initial item reduction of the civil participation scale (minus 2 items) and the self-control subscale (minus 2 items; see Supplement H in OSF). We then conducted a confirmatory factor analysis (CFA) using STATA 17. To account for the non-normality in the data, we applied the Satorra-Bentler corrected maximum likelihood estimation method.

### 2.10 Confirmatory Factor Analysis

First, five latent factors were modeled for all remaining 31 items, with latent factors being allowed to co-vary. The model fit the data well: Satorra-Bentler corrected  $\chi^2=692.05$ ,  $df=424$ ,  $p<.001$ ; RMSEA-SB=0.038 (90% CI [0.043 –0.052]), CFI-SB=0.950, SRMR=0.069. Next, because we wanted to reduce the number of items further, we inspected factor loadings, item covariances within each subscale, and item cross-loadings. This led to the removal of several items per subscale, leaving a total of five items per subscale (see OSF for documentation of iterative item deletion procedure). Modeling the remaining 25 items again as five separate but correlated factors, the model fit the data very well: Satorra-Bentler corrected  $\chi^2=357.69$ ,  $df=265$ ,  $p<.001$ ; RMSEA-SB=0.028 (90% CI [0.032 –0.045]), CFI-SB=0.979, SRMR=0.047<sup>2</sup>. The latent factors correlated meaningfully, but not too highly with each other, with correlations ranging from  $r=-.09$  to 0.56 (see Supplement I in OSF for correlations table). All subscales yielded good internal consistency, ranging between  $\alpha = 0.73$  to 0.91 (Table 1). Table 1 also provides the item text, factor loadings,  $M$ , and  $SD$  values of the final 25-item digital flourishing scale.

### 2.11 Comparing Different Factor Solutions

Next, we tested whether a higher-order factor model would fit the data better than a five-factor model with correlated factors. The higher order factor model fit the data: Satorra-Bentler corrected  $\chi^2=475.25$ ,  $df=270$ ,  $p<.001$ ; RMSEA-SB=0.042 (90% CI [0.046 –0.057]), CFI-SB=0.953; SRMR=0.09. A  $\chi^2$ -difference test ( $\chi^2$  Diff (5)=202.68,  $p<.05$ ) was significant, indicating that the model with five factors fit the data slightly better than the higher-order model. Next, we explored a unidimensional model, which did not fit the data well: Satorra-Bentler corrected  $\chi^2=2373.98$   $df=275$ ,  $p<.001$ , RMSEA-SB=0.133 (90% CI

<sup>2</sup> We want to note that one item from the civil participation scale did not load very highly on the factor (0.42) and could thus be removed. Yet, for this iteration of the scale, we keep it to uphold the goal of 5 items per factor. Furthermore, Cronbach's alpha was not affected by deleting this item.

**Table 1** Factor Loadings, Reliability, and Descriptives for The Final Digital Flourishing Items Based on CFA of Study 2

	Connectedness	Civil Participation	Positive Social Comparison	Authentic Self-Disclosure	Self-control
1. CON1 I feel part of a community when I interact with others online	0.833				
2. CON2 I feel a bond to my online community/network	0.821				
3. CON3 I find great purpose and meaning in my online interactions	0.746				
4. CON4 When I browse through my online communication platforms, I feel a sense of connection to others	0.761				
5. CON5 I could turn to my online community if I needed specific advice on how to handle a problem	0.695				
1. CP1 When I interact with others about politics online, I know how to have a civil discussion		0.654			
2. CP2 During my interactions online, I know how to take a stand for something important to me in a civil manner		0.678			
3. CP3 In online discussions, I know how to get my point across without offending people		0.721			
4. CP4 When I interact with others online I tend to respond reasonably even when they make me angry		0.536			
5. CP5 When I communicate online, I am careful to adapt my comments and behaviors to be appropriate for my audience		0.416			
1. PSC1 Comparing myself to others online motivates me to accomplish my goals			0.811		

**Table 1** (continued)

	Connectedness	Civil Participation	Positive Social Comparison	Authentic Self-Disclosure	Self-control
2. PSC2 I compare my life to those online who I can learn from			0.727		
3. PSC3 Seeing how others present themselves online motivates me to make changes in my own life			0.757		
4. PSC4 I compare my life to those online who are going to push me to be better			0.751		
5. PSC5 Seeing other's achievements online inspires me to do better			0.808		
1. ASD1 I allow my social network to see who I really am				0.839	
2. ASD2 I feel comfortable presenting who I truly am online, in the same way I do offline				0.818	
3. ASD3 What I post online reflects who I really am				0.761	
4. ASD4 slightly altered: I show my true self online (reversed SD4RC)				0.867	
5. ASD5 slightly altered: When interacting online, I feel comfortable presenting the person I am				0.820	
1. SC1 For the most part, I feel in control of how much time I spend interacting with others online					0.785
2. SC2 I feel in control over when to start and when to stop spending time on online communication					0.813
3. SC3 I communicate online when I want to, not when notifications tell me to					0.548



**Table 1** (continued)

	Connectedness	Civil Participation	Positive Social Comparison	Authentic Self-Disclosure	Self-control
4. SC4 I am able to disconnect from my online interactions when I need a break					0.693
5. SC5 When I browse through content online I feel in control of how I spend my time					0.709
Cronbach's $\alpha$	0.879	0.735	0.880	0.911	0.830
Mean (SD)	4.61 (1.21)	5.56 (0.839)	4.13 (1.31)	4.75 (1.36)	5.61 (1.06)

Note. Standardized coefficients are reported. All factor loadings are significant at  $p < .001$

**Table 2** Pearson Correlation Results ( $r$ ) for DFS and Intrinsic Needs, Study 2 (N=435)

	Connectedness	Civil Participation	Positive Social Comparison	Authentic Self-Disclosure	Self-control
Competence	0.343**	0.342**	0.224**	0.401**	0.312**
Relatedness	0.427**	0.390**	0.172**	0.433**	0.280**
Autonomy	0.298**	0.361**	0.083	0.456**	0.455**

Note. \*\* $p < .001$ . A regression analysis of each DF subdimension and the 3 basic needs can be found in Supplemental J in OSF.

[0.144 – 0.154]), CFI-SB=0.518, SRMR=0.151. While the higher-order model fit the data as well, the five-factor model was slightly superior.

## 2.12 Relationship of Digital Flourishing and Basic SDT Needs

A Pearson correlation analysis was conducted with the basic SDT needs (i.e., competence, relatedness, autonomy) and each flourishing component. All, but the positive social comparison subscale, were significantly correlated with all three basic SDT needs (see Table 2). Variations in strengths of the associations are in line with our theoretical predictions for three of the five subscales.

## 2.13 Discussion

Study 2 confirmed the factor structure of the five-dimensional DFS and demonstrated that the multidimensional model fit the data slightly better than a higher-order model. Thus, while it is theoretically and empirically meaningful to calculate a digital flourishing composite score combining all subscales, more information can be obtained when investigating the five dimensions individually. All five flourishing subscales appeared internally consistent and were significantly associated with satisfaction of basic psychological needs, supporting the overall notion that the flourishing dimensions reflect users' positive, potentially well-being enhancing perceptions of mediated interactions.

In line with our predictions and conceptualizations of the subscales, connectedness was mostly associated with relatedness, positive social comparison with competence, and self-control with autonomy (Table 2). Even though we expected civil participation to be most highly associated with competence need satisfaction, the results indicated a slightly stronger significant correlation with relatedness, which, given the final version of this subscale, makes sense (see Table 1 for item wording). The more civil we perceive our online expressions (e.g., the less offensively we communicate), the more likely we are to build positive relationships with others, thus, satisfying our relatedness need. Furthermore, authentic self-disclosure was significantly associated with all three basic needs, with the highest being autonomy and relatedness, instead of competence. This is also plausible given the final version of this subscale. Perceiving to present oneself in honest ways online, rather than manipulating one's presentation, should satisfy the feeling of being in control of one's environment (autonomy) as research has shown (e.g., Grieve & Watkinson, 2016). It also allows for deeper connections to be built, and, in turn, greater relatedness. Accordingly, while the present evidence should by no means be interpreted as causal, satisfying the SDT needs may represent an important mechanism between users' digital flourishing perceptions and well-being outcomes in future studies (see also Martela & Sheldon 2019). However, it is still unclear whether DFS is directly associated with well-being. Additionally, the current study used a Likert-type scale to assess people's general agreement or disagreement with the experiences and behaviors as they relate to their mediated social interactions. However, because mediated interactions and their perceptions change with time and circumstances results could be more specific if the scale refers to a specific time-frame (e.g., in the past month). Consequently, Study 3 was conducted to assess further criterion validity of the DFS with general well-being measures in relation to the last month.

### 3 Study 3

The main goal of the pre-registered Study 3<sup>3</sup> (variables, sampling, and analysis plan; see OSF) was to measure the association of the DFS with well-being. It was predicted that the DFS would correlate strongly and positively with measures of flourishing (Diener et al., 2010) and satisfaction with life (Diener et al., 1985). That is, individuals with good mental health and well-being should also flourish digitally, and vice versa.

#### 3.1 Method

##### 3.1.1 Sample and Procedure

A Qualtrics panel was employed in December 2021 with a sample of  $N=486$  representative of the American population in terms of age, gender, ethnicity, and income. Of the sample, 51.8% identified as female and the average age was 48.67 years ( $SD=19.02$ ,  $Min=18$   $Max=88$ ). Detailed demographic analysis can be found in OSF Supplemental K. Three participants were excluded due to speeding (see Supplemental K for details on data cleaning procedures), leaving a total of  $N=483$  responses used for the analyses.

<sup>3</sup> The variables reported here are part of a larger set of variables of another validity study of the DFS not reported here. For the purpose of this paper, only the criterion validity variables are reported here.

**Table 3** Pearson Correlation Results (*r*) for all DFS subdimensions with well-being, Study 3 (N=483)

	Civil Participation	Positive Social Comparison	Authentic Self-Disclosure	Self-Control	DFS Total	Flourishing	SWL
Connect- edness	0.534**	0.729**	0.515**	0.339**	0.852**	0.342**	0.345**
Civil Participa- tion		0.362**	0.610**	0.575**	0.764**	0.378**	0.319**
Positive Social Compara- ison			0.299**	0.188**	0.736**	0.168**	0.228**
Authentic Self-Dis- closure				0.598**	0.768**	0.422**	0.403**
Self- control					0.652**	0.373**	0.292**
DFS total						0.412**	0.408**
Flourish- ing							0.707**

Note. \*\* $p < .001$ , \*  $p < .05$

After giving informed consent, participants reported key demographic characteristics, followed by the DFS and the two respective well-being scales (among a larger item battery not reported here). The 25-item DFS asked participants how true the described behaviors were for them in the past month, using a 5-point Likert-type scale ranging from 1 (not at all true of me) to 5 (very true of me) with an option of “Not applicable for me.” The full scale yielded good internal consistency including all respective subscales (connectedness, 5 items:  $\alpha = 0.904$ ; civil participation, 5 items:  $\alpha = 0.774$ ; Positive social comparison, 5 items:  $\alpha = 0.889$ ; Authentic self-disclosure, 5 items:  $\alpha = 0.868$ ; Self-control, 5 items:  $\alpha = 0.828$ ; Full DFS:  $\alpha = 0.943$ ,  $M = 3.70$ ,  $SD = 0.709$ ). Well-being was assessed with Diener et al.’s (2010) 8-item flourishing instrument ( $\alpha = 0.909$ ,  $M = 4.07$ ,  $SD = 0.757$ ) and the 5-item Satisfaction with Life Scale (SWLS, Diener et al., 1985;  $\alpha = 0.909$ ,  $M = 3.52$ ,  $SD = 1.07$ ), using a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree).

### 3.2 Analysis and Results

The results of a Pearson correlation analysis revealed that the Digital Flourishing Scale significantly and strongly correlated with flourishing ( $r = .412$ ,  $p < .001$ ) and satisfaction with life ( $r = .408$ ,  $p < .001$ ). Table 3 summarizes the results for each DFS subscale.

### 3.3 Discussion

Results of Study 3 indicate good criterion validity of the DFS with well-being. Consequently, the more individuals indicate to flourish digitally, the more they also feel happy, satisfied and content with their lives, and vice versa.

## 4 General Discussion

The development of the DFS is starting to close a major gap in the literature: prior research has (a) mostly developed scales to measure users' perceived negative experiences with digital communication technologies and (b) mostly focused on single devices or applications rather than mediated social interactions, which happen across multiple platforms and in an ever-changing digital landscape.

Theoretically, we proposed six relevant dimensions of digital flourishing, and empirically confirmed five, including *connectedness*, *civil participation*, *positive social comparison*, *authentic self-disclosure*, and *self-control*, with five indicators per subscale. High digital flourishing thus captures users' multi-faceted perceptions of benefits from digital communication technologies: feeling closely connected to and supported by their online community, experiencing considerate and reflected interactions with others and consistent and authentic presentation in digital arenas, feeling inspired when comparing with others, and in control about when to start and when to stop interacting online.

### 4.1 Contributions to the Literature

To the best of our knowledge, the only concept similar to digital flourishing thus far is the *digital well-being* concept proposed by Vanden Abeele (2020), who defines it as a state of balance between time spent connecting and disconnecting from one's digital, particularly mobile, *devices*. Vanden Abeele's (2020) dynamic digital well-being framework considers various global factors that play into users' experiences with mobile technology in general, including person-, context- and device-specific factors. As such, her model includes both intra- and inter-individual variability, which research on the effects of new digital technologies on well-being and mental health finds to be substantial (Valkenburg et al., 2021), a point not (yet) addressed by the here-presented DFS. While there might be slight overlap between these two conceptualizations, the DFS presents a unique contribution in numerous ways: digital flourishing is chiefly concerned with mediated interactions and does not require a focus on single devices or applications. Most importantly however, the present research contributes a reliable and valid measure of digital flourishing, while the digital well-being concept currently only yields theoretical and conceptual utility. In addition, while some existing scales already measure individual DFS dimensions, the DFS offers a more comprehensive and channel-independent instrument to assess multiple facets of users' positive perceptions of mediated social interactions. The DFS subscales can, however, also be used independently or adjusted to refer to only a single technological context (e.g., Instagram) whenever the circumstances warrant such adaptation (e.g., when used for specific age groups or in the context of work or in education).

While not limited to individual channels, the DFS has great potential to capture when and for whom the use of certain applications (i.e., social media) or devices (mobile vs. desktop) is linked to positive outcome perceptions. Specifically, further research validating and exploring the DFS can investigate how the usage of individual technologies modulates person level or situational DFS scores. In other words, the DFS allows researchers to explore and compare the positive outcome perceptions that users form around mediated interactions across several digital channels. Additionally, digital flourishing perceptions may operate as both a mediating and moderating variable between actual digital technology

use and well-being outcomes. In doing so, the DFS may help explain many of the conflicting research findings on digital technology and well-being (Dienlin & Johannes, 2020; Meier & Reinecke, 2021). For example, research has already alluded to the fact that social comparison and more passive than active use on social media can explain some of its (perceived) negative well-being effects (Verduyn et al., 2020). However, passive use and social comparison have also been linked to increased well-being (Meier et al., 2020; Kross et al., 2020). The DFS thus focuses our attention on key interindividual differences in technology use perceptions, which may clarify the complex nuances of idiographic (social) media effects (see Valkenburg et al., 2021).

Lastly, a person-specific approach that compares the personality attributes, demographics, device and application use, and usage contexts of individuals that perceive to digitally flourish (vs. those who do not) can aid in developing personalized interventions. The positive psychological framework applied here provides scholars, practitioners, and lay people a language to communicate about the ways in which their mediated interactions make them feel and do well in life, rather than narrowing our focus on how much (or little) they take away from their well-being. Exploring person-specific digital flourishing may thus help redesign digital technologies in ways that foster well-being.

## 4.2 Limitations and Directions for Future Research

Importantly, the DFS should not be interpreted to reflect *actual* positive effects of technology use on well-being. Instead, it is limited to users' self-perceptions. In addition, the work presented here does not tell us where these positive perceptions come from. How much are they driven by channel- vs. communication characteristics (Meier & Reinecke, 2021) or user characteristics such as personality traits or socioeconomic status? This remains a crucial question for future studies.

Furthermore, the scale is certainly not fully comprehensive to measure all facets of digital flourishing. Future research could explore additional dimensions of digital flourishing such as perceptions of recreation and information gain from mediated interactions.

While the current research theoretically and empirically introduces the concept of digital flourishing, future validation studies are also needed. Specifically, the cross-sectional nature of our data does not allow us to establish how much digital flourishing perceptions contain immutable trait vs. fluctuating state variance. Future studies should utilize longitudinal designs (e.g., panel surveys or experience sampling) to determine the proportions of trait and state variance of the scale, for instance, with a latent-state-trait analysis. Combining varying timeframes and context with longitudinal methods will provide additional insight into the stability and generalizability of users' digital flourishing perceptions. Similarly, future validation studies from non-U.S.-centric populations would benefit the DFS's generalizability.

Finally, the means for the civil participation and self-control subscales were very high in Study 2 ( $M=5.56$  and  $M=5.61$  respectively), potentially indicating a ceiling effect resulting from social desirability bias. Future studies should control for participants social desirability bias as well as explore the inclusion of distractor items as a mechanism to increase valid responses.

Furthermore, studies evaluating digital flourishing in relation to a specific device or application are encouraged to include manipulation checks that assess the user's technologi-

cal competence. The inclusion of items measuring participants' proficiency, in relation to a specific device or application, may increase the reliability of responses.

## 5 Conclusion

The digital flourishing scale (DFS) offers a new instrument to assess individuals' positive perceptions of their mediated interactions (e.g., via social media) that are closely connected to well-being. Most studies on social media and CMC to date either take a monolithic, channel-focused "screen time" approach, or view technology use as inherently problematic (e.g., smartphone addiction). Yet, on which core dimensions, to what extent, and by whom mediated interactions are perceived as beneficial has received less attention. We address this gap through the DFS, a comprehensive five-dimensional measure that taps into users' perceptions of their mediated social interactions across technologies and on the core dimensions of authentic self-disclosure, civil participation, positive social comparison, connectedness, and self-control. We hope researchers will find the DFS and the accompanying positive psychology lens useful to capture who perceives themselves as flourishing—rather than languishing—when they interact via digital technologies.

**Funding** This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Open access funding provided by SCEL, Statewide California Electronic Library Consortium

## Declarations

**Conflict of interest** The authors have no relevant financial or non-financial interests to disclose.

**Supplemental Material Access** All supplemental material can be found in OSF (anonymous link): [https://osf.io/pef7a/?view\\_only=436d716c8235436c9a9d436fe94c2844](https://osf.io/pef7a/?view_only=436d716c8235436c9a9d436fe94c2844).

The anonymous pre-registration link for Study 2 can be found here: [https://osf.io/w7u5g/?view\\_only=06954e478c734345932a1ea6a1de4b9c](https://osf.io/w7u5g/?view_only=06954e478c734345932a1ea6a1de4b9c).

The anonymous pre-registration link for Study 3 can be found here: [https://osf.io/e4m8z/?view\\_only=e1480f1184a64351aebeab26a8756c56](https://osf.io/e4m8z/?view_only=e1480f1184a64351aebeab26a8756c56).

**Open Access** This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by/4.0/>.

## References

- Bayer, J. B., Triêu, P., & Ellison, N. B. (2020). Social media elements, ecologies and effects. *Annual Review of Psychology*, 71, 10.1–10.27.
- Carpenter, S. (2018). *Ten steps in scale development and reporting*. A guide for researchers. *Communication- Methods and Measures*, 12(1), 25–44. <https://doi.org/10.1080/19312458.2017.1396583>

- Coe, K., Kenski, K., & Rains, S. A. (2014). Online and uncivil? Patterns and determinants of incivility in newspaper website comments. *Journal of Communication*, 64, 658–679. doi:<https://doi.org/10.1111/jcom.12104>.
- 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, 227–268. [https://doi.org/10.1207/S15327965PL111104\\_01](https://doi.org/10.1207/S15327965PL111104_01)
- Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D., Oishi, S., & Biswas-Diener, R. (2010). New measures of well-being: flourishing and positive and negative feelings. *Social Indicators Research*, 39, 247–266. <https://doi.org/10.1007/s11205-009-9493-y>.
- Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The satisfaction with life scale. *Journal of Personality Assessment*, 49(1), 71–75. [https://doi.org/10.1207/s15327752jpa4901\\_13](https://doi.org/10.1207/s15327752jpa4901_13).
- Diener, E. (1984). Subjective well-being. *Psychological Bulletin*, 95(3), 542–575. <https://doi.org/10.1037/0033-2909.95.3.542>.
- Dienlin, T., & Johannes, N. (2020). The impact of digital technology use on adolescent well-being. *Dialogues in Clinical Neuroscience*, 22(2), 135–142. <https://doi.org/10.31887/DCNS.2020.22.2/dienlin>.
- Ferriss, A. L. (2002). Studying and measuring civility: a framework, trends and scale. *Sociological Inquiry*, 72(3), 376–392. <https://doi.org/10.1111/1475-682X.t01-1-00023>.
- Grieve, R., Watkinson, J., & Cyberpsychology (2016). Behavior, and Social Networking, 19(7), 420–425. <https://doi.org/10.1089/cyber.2016.0010>
- Hall, J. A., Steele, R. G., Christofferson, J. L., & Mihailova, T. (2021). Development and initial evaluation of a multidimensional digital stress scale. *Psychological Assessment*, 33(3), 230–242. <https://doi.org/10.1037/pas0000979>.
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2017). *A primer on partial least squares structural equation modeling (PLS-SEM)* (2nd ed.). Thousand Oaks, CA: Sage.
- Hartmann, T., & Reinecke, L. (2013). Skalenkonstruktion in der Kommunikationswissenschaft. *Handbuch standardisierte Erhebungsverfahren in der Kommunikationswissenschaft* (pp. 41–60). Wiesbaden: Springer VS.
- Hofmann, W., Reinecke, L., & Meier, A. (2017). Of sweet temptations and bitter aftertaste: self-control as a moderator of the effects of media use on well-being. In L. Reinecke, & M. B. Oliver (Eds.), *The Routledge handbook of media use and well-being: international perspectives on theory and research on positive media effects* (pp. 211–222). New York: Routledge.
- Huta, V., & Waterman, A. S. (2014). Eudaimonia and its distinction from hedonia: developing a classification and terminology for understanding conceptual and operational definitions. *Journal of Happiness Studies*, 15(6), 1425–1456. <https://doi.org/10.1007/s10902-013-9485-0>.
- Kross, E., Verduyn, P., Sheppes, G., Costello, C. K., Jonides, J., & Ybarra, O. (2020). Social media and well-being: Pitfalls, progress, and next steps. Trends in Cognitive Sciences. Advance online publication. <https://doi.org/10.1016/j.tics.2020.10.005>
- Kwon, M., Lee, J. Y., Won, W. Y., Park, J. W., Min, J. A., Hahn, C., & Kim, D. J. (2013). Development and validation of a smartphone addiction scale (SAS). *PloS one*, 8(2), e56936. <https://doi.org/10.1371/journal.pone.0056936>.
- Liu, D., Baumeister, R. F., Yang, C. C., & Hu, B. (2019). Digital communication media use and psychological well-being: a meta-analysis. *Journal of Computer-Mediated Communication*, 24(5), 259–273. <https://doi.org/10.1093/jcmc/zmz013>.
- Luo, M., & Hancock, J. T. (2020). Self-disclosure and social media: motivations, mechanisms and psychological well-being. *Current Opinion in Psychology*, 31, 110–115. <https://doi.org/10.1016/j.copsyc.2019.08.019>.
- Martela, F., & Sheldon, K. M. (2019). Clarifying the concept of well-being: psychological need satisfaction as the common core connecting eudaimonic and subjective well-being. *Review of General Psychology*, 23(4), 458–474. <https://doi.org/10.1177/1089268019880886>.
- Meier, A., Gilbert, A., Börner, S., & Possler, D. (2020). Instagram inspiration: how upward comparison on social network sites can contribute to well-being. *Journal of Communication*, 70(5), 721–743. doi: <https://doi.org/10.1093/joc/jqaa025>.
- Meier, A., & Reinecke, L. (2021). Computer-mediated communication, social media, and mental health: a conceptual and empirical meta-review. *Communication Research*, 48(8), 1182–1209. <https://doi.org/10.1177/0093650220958224>.
- Nick, E. A., Cole, D. A., Cho, S. J., Smith, D. K., Carter, T. G., & Zelkowitz, R. L. (2018). The online social support scale: measure development and validation. *Psychological Assessment*, 30(9), 1127–1143. <https://doi.org/10.1037/pas0000558>.
- Orben, A. (2020). Teenagers, screens and social media: a narrative review of reviews and key studies. *Social Psychiatry and Psychiatric Epidemiology*, 55(4), 407–414. <https://doi.org/10.1007/s00127-019-01825-4>.

- O'Sullivan, P. B., & Carr, C. T. (2018). Masspersonal communication: a model bridging the mass-interpersonal divide. *New Media & Society*, 20(3), 1161–1180. <https://doi.org/10.1177/1461444816686104>.
- Podsakoff, P. M., MacKenzie, S. B., Lee, J. Y., & Podsakoff, M. P. (2003). Common method biases in behavioral research: A critical review of the literature and recommended remedies. *Journal of Applied Psychology*, 88, 879–903. DOI: <https://doi.org/10.1037/00219010.88.5.879>
- Przybylko, G., Morton, D. P., Morton, J. K., Renfrew, M. E., & Hinze, J. (2021). An interdisciplinary mental wellbeing intervention for increasing flourishing: two experimental studies. *The Journal of Positive Psychology*. DOI: <https://doi.org/10.1080/17439760.2021.1897868>.
- Przybylski, A. K., Murayama, K., DeHaan, C. R., & Gladwell, V. (2013). Motivational, emotional, and behavioral correlates of fear of missing out. *Computers in Human Behavior*, 29(4), 1841–1848. <https://doi.org/10.1016/j.chb.2013.02.014>.
- Przybylski, A. K., & 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. *Psychological Science*, 28(2), 204–215. <https://doi.org/10.1177/0956797616678438>.
- Reinecke, L., & Meier, A. (2021). Media entertainment as guilty pleasure? The appraisal of media use, self-control, and entertainment (AMUSE) model. In P. Vorderer, & C. Klimmt (Eds.), *The Oxford handbook of entertainment theory* (pp. 205–230). Oxford Univ. Press. <https://doi.org/10.1093/oxfordhb/9780190072216.013.12>.
- Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, 57(6), 1069–1081. <https://doi.org/10.1037/0022-3514.57.6.1069>.
- Sabatini, F., & Sarracino, F. (2017). Online networks and subjective well-being. *Kyklos*, 70(3), 456–480. <https://doi.org/10.1111/kykl.12145>.
- Schreurs, L., & Vandenbosch, L. (2021). The development and validation of measurement instruments to address interactions with positive social media content. *Media Psychology*, 1–28. <https://doi.org/10.1080/15213269.2021.1925561>.
- Seligman, M. E. (2011). *Flourish: a new understanding of happiness, well-being - and how to achieve them*. Nicholas Brealey.
- Stevens, F., Nurse, J. R. C., & Arief, B. (2021). Cyber stalking, cyber harassment, and adult mental health: a systematic review. *Cyberpsychology Behavior and Social Networking*, 24(6), 367–376. <https://doi.org/10.1089/cyber.2020.0253>.
- Stromer-Galley, J., & Wichowski, A. (2010). Political discussion online. In M. Consalvo, & C. Ess (Eds.), *The blackwell handbook of Internet Studies* (pp. 168–187). Oxford, England: Blackwell-Wiley.
- U.S. Census Bureau U.S. Census Bureau releases new educational attainment data. Release number CB20-TPS.09. <https://www.census.gov/newsroom/press-releases/2020/educational-attainment.html#:~:text=In%202019%2C%20high%20school%20was,from%2029.9%25%20to%2036.0%25>.
- Valkenburg, P. M., Beyens, I., Pouwels, J. L., van Driel, I. I., & Keijsers, L. (2021). Social media use and adolescents' self-esteem: heading for a person-specific media effects paradigm. *Journal of Communication*, 71(1), 56–78. <https://doi.org/10.1093/joc/jqaa039>.
- Vanden Abeele, M. M. (2020). Digital well-being as a dynamic construct. *Communication Theory*. <https://doi.org/10.1093/ct/qtaa024>.
- 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>.
- Verduyn, P., Ybarra, O., Résibois, M., Jonides, J., & Kross, E. (2017). Do social network sites enhance or undermine subjective well-being? A critical review. *Social Issues and Policy Review*, 11(1), 274–302. <https://doi.org/10.1111/sipr.12033>.
- Worrall, H., Schweizer, R., Marks, E., Yuan, L., Lloyd, C., & Ramjan, R. (2018). The effectiveness of support groups: a literature review. *Mental Health and Social Inclusion*, 22(2), 85–93.
- Ybarra, M. L., Mitchell, K. J., Palmer, N. A., & Reisner, S. L. (2015). Online social support as a buffer against online and offline peer and sexual victimization among US LGBT and non-LGBT youth. *Child Abuse & Neglect*, 39, 123–136. DOI: <https://doi.org/10.1016/j.chiabu.2014.08.006>.



## Authors and Affiliations

**Sophie H. Janicke-Bowles<sup>1</sup> · Tess M. Buckley<sup>1</sup> · Rikishi Rey<sup>2</sup> · Tayah Wozniak<sup>3</sup> · Adrian Meier<sup>4</sup> · Anna Lomanowska<sup>5</sup>**

---

✉ Sophie H. Janicke-Bowles  
bowles@chapman.edu

Tess M. Buckley  
tebuckley@chapman.edu

Rikishi Rey  
rrey@clemson.edu

Tayah Wozniak  
tayah.wozniak@cui.edu

Adrian Meier  
adrian.meier@fau.de

Anna Lomanowska  
anna.lomanowska@gmail.com

<sup>1</sup> Chapman University, 1 University dr, 92866 Orange, CA, USA

<sup>2</sup> Clemson University, 29634 Clemson, SC, USA

<sup>3</sup> Concordia University Irvine, 1530 Concordia West, 92612 Irvine, CA, United States

<sup>4</sup> Friedrich-Alexander University Erlangen-Nuremberg, P.O. Box 393190020, Nuremberg, Germany

<sup>5</sup> Toronto General Hospital University Health Network, 200 Elizabeth St, M5G 2C4 Toronto, ON, Canada