# Assessing the validity of self-report social media use: Evidence of No relationship with objective smartphone use

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## ABSTRACT

Social media use research remains dominated by self-report measures, despite concerns they may not accurately reflect objective social media use. The association between commonly employed self-report measures and objective social media use remains unclear. The aim of this study was to determine the degree of association between an objective and commonly employed subjective measures of social media use. The study specifically examined a single-estimate self-report measure, a problematic social media use scale, and objective use derived from smartphone data, in a sample of 209 individuals. The findings showed a very weak non-significant relationship between the objective measure and the single-estimate measure, ($r = -.04$, $p = .58$, $BF_{10} = 0.18$), and a weak significant relationship between the objective measure and the problematic social media use scale ($r = .19$, $p = .01$, $BF_{10} = 3.04$). These findings converge with other recent research to suggest there is very little shared variance between subjective estimates of social media use and objective use. This highlights the possibility that subjective social media use may be largely unrelated to objective use, which has implications for ensuring the rigor of future research and raising potential concerns regarding the veracity of previous research.

## 1. Introduction

Social media is a growing facet of everyday life. Between 2020 and 2021 the number of active social media users grew by 3.2% from 3.8 to 4.2 billion, with 53.6% of the global population now actively using social media (Digital 2021: Australia, 2021). As the presence of social media has grown, so too has corresponding social media research seeking to understand the potential social, emotional, and cognitive effects of this increasingly ubiquitous dimension of life (Griffioen et al., 2020; Keles et al., 2020; Valkenburg, 2022). Despite rapid growth in the field, our understanding of the impacts of social media use remains somewhat limited (Keles et al., 2020). This is likely to be in part due to the rapidly changing nature of the social media landscape and patterns of usage. Importantly, however, there are a number of potential methodological limitations that may restrict the validity, generalizability, and application of many current findings (Keles et al., 2020).

As has been noted in a number of recent reviews, there is a striking lack of consistency in social media use measures between studies (Griffioen et al., 2020; Keles et al., 2020). This limits the ability of subsequent studies to validate and corroborate previous research, which can limit progress in the field (Griffioen et al., 2020; Keles et al., 2020).

This has led to calls for researchers to work towards establishing and consolidating best practice methodologies to facilitate replicability and application of findings (Griffioen et al., 2020; Keles et al., 2020).

Currently, social media research appears to be dominated by self-report measures of social media use, which many concede are suboptimal (Griffioen et al., 2020; Keles et al., 2020; Valkenburg, 2022). A major concern with these measures is that not only are they vulnerable to biased responding, but that they may not be representative of actual use. Specifically, perceived use may be influenced by numerous factors including emotional state, selective or faulty recall, and contextual research factors (e.g. study design components or questionnaire item wording contributing to response bias; Griffioen et al., 2020). The major concern with this is that findings derived from studies utilising these measures may not be demonstrating associations between social media use and various constructs under investigation (e.g. anxiety, depression, sleep), but associations with *perceptions* of social media use that may or may not be an accurate representation of actual use.

One of the most common methods of assessing social media use is single estimate measures, where participants are asked to estimate as accurately as possible how much social media they typically use over a particular time frame (Griffioen et al., 2020). These measures are then

used to examine associations between social media use and other constructs (e.g., sleep, depression; Keles et al., 2020; Woods & Scott, 2016). A common alternative to such single estimate measures are self-report scales assessing 'problematic' social media use (Ellis et al., 2019; Vernon et al., 2015). As with self-report single estimates, there does not appear to be a consistently employed definition or objective criteria for determining 'problematic' social media use and such scales are not typically validated against objective measures of use when created. Indeed, the noted expansion of self-report measures that seek to define social media use in pathological terms has attracted significant criticism recently due to the lack of objective validation criteria, and inflated estimates of problematic use (Satchell et al., 2021). Further, because these measures are often insufficiently defined, it is often implied that problematic use is associated with extended time spent using social media (Marino et al., 2018). However, little to no research has actually sought to assess whether this may be true or whether problematic social media use is totally independent from time spent using social media. In principle it is possible that problematic social media use can occur independently from the total amount of social media consumed, though in practice it would seem likely that scales assessing the degree to which social media use is experienced as problematic would show a degree of association with actual social media consumption. As measures of problematic use are commonly employed in the literature, the present study also examined the degree of association between a measure of problematic social media use and both self-estimate and objective social media use. This will inform whether problematic social media use may indeed be associated with time spent using social media or if the two are independent constructs. Specifically, this analysis will enhance our understanding of what factors the construct of problematic social media use encompasses and if it does converge with time spent using social media or is more related to the perceived interference of use that may be unrelated to time spent using social media. Similar methodological limitations have begun to be recognised in the converging field of smartphone use, including inconsistent definitions of use and problematic use, and domination of self-report measures (Ellis et al., 2019). Recently Ellis et al. (2019) evaluated various self-report measures of smartphone use. Of particular relevance, they collected single estimate measures of smartphone use, objective smartphone use (recorded by the screentime function available in iPhones), and the Problematic Mobile Phone Use Questionnaire (PMPUQ; Ellis et al., 2019).

The findings of this study demonstrated that, the single largest association between self-report and objective measures of general smartphone use was the relationship between a self-estimate of total screen time which showed a modest though significant association with objective screen time use (r = 0.48; Ellis et al., 2019). While this degree of shared variance between objective and subjective indicators of use (23%) may be considered less than ideal, the fact that the relationship is moderate and significant provides a degree of reassurance that single-estimate self-report measures may be tapping the intended construct. Importantly, however, current research has not yet established whether such single self-estimate measures are sensitive to more specific patterns of use, and in particular, social media use. Given the extensive literature on social media use that has relied exclusively on self-report, it is critical to establish whether such an association exists and its magnitude. Over the past few years, objective measures of social media use have become more accessible with the introduction of Apple's Screen Time function released with ios 12 in 2018. Similar functionality is now also accessible on Android platforms, either via built-in or third party applications. This has meant that smartphone data provides a potentially attractive means of assessing patterns of social media use. Such a source of objective social media use is also attractive due to indications that the vast majority of consumption occurs via smartphones (Tankovska, 2021). This may be due to a number of factors, including that many platforms are optimised for mobile viewing (Instagram and TikTok) and some are exclusively available via mobile devices (Snapchat). Similarly, accessibility and usage prompts (notifications) are also likely to increase use. It is unsurprising therefore that data suggest that common platforms (e.g. Facebook) are accessed exclusively by mobile phones by over 80% of users, with more than 98% of users accessing the platform via mobile phones (Tankovska, 2021). As such, mobile phone data can provide a powerful and highly valid alternative to self-report measures, with recent reviews calling for increased use of these measures (Tankovska, 2021; Valkenburg, 2022).

Recently some studies have begun to examine similar issues of measurement validity in social media use. Recent studies conducted by Verbij et al. (2021; 2022) examined associations between self-report and objective Instagram, Snapchat, and WhatsApp use in adolescents who were Android users. Findings suggested that adolescents tended to overestimate their use of these social media platforms and that retrospective self-report had limited convergent validity with actual use. Similarly, studies conducted by Boyle et al. (2022) and Burnell et al. (2021), examined associations between self-report and objective Facebook, Instagram, Twitter and Snapchat use in university students who were iPhone users and both also found that participants tended to overestimate use.

It is important to note that these studies focus on daily measures of individual platform use (Boyle et al., 2022; Burnell et al., 2021; Verbij et al., 2021; Verbeij et al., 2022). This research has been useful in providing information on the concordance between self-estimates and objective use of specific platforms within a very constrained timeframe. Given the diverse nature and function of various social media platforms, (eg. Facebook mostly personal written text, Instagram mostly still visual, twitter, short form text statuses, tik tok short form video), the ability to estimate specific platform use may vary depending on the type of content or engagement. As such, estimates of individual platform use may be related to specific features of that platform rather than reflective of ability to estimate social media use, as an over-arching construct.

Additionally, it is important to note that past findings using self-estimates of social media use have tended to employ more general measures, such as estimates of average daily or weekly social media use in general, rather than estimates of specific platform use within specific timeframes (Griffioen et al., 2020; Keles et al., 2020). As such, to establish the validity of prior findings, it is important to directly compare the approach most commonly employed in past studies (i.e single self-estimate usage) with objective measures. Indeed, while individuals may struggle to accurately estimate specific platform use (Boyle et al., 2022; Burnell et al., 2021; Verbij et al., 2021; Verbeij et al., 2022), it is possible that general estimates of social media use across platforms may show greater concordance with objective measures of total use, as with Ellis et al.'s. (2019) finding regarding self-estimates and objective smartphone use.

Some research has been conducted examining general social media estimates such as a study conducted by Johannes et al. (2021), which found a reasonably strong correlation (r = 0.57) between daily self-estimates and objective social media use among iPhone users. However, the specific platforms included in the objective measure utilised by this study is unclear as the objective social media measure used was the "social networking" category embedded in the iOS screentime function. A concern with this methodology is that the platforms within this category have been known to change with different iterations of iOS. Regardless, it will be valuable for further research to corroborate this finding and examine self-estimate measures that consider greater reference periods (eg. one week) that are commonly utilised in the literature (Griffioen et al., 2020; Keles et al., 2020). It is also relevant to note that no research examining associations between self-report and objective use have included TikTok. This is particularly relevant as TikTok has now grown to be one of the most used social media platforms globally, and it provides a unique form of content (short form video), compared to other previously examined platforms (Digital 2021: Australia, 2021).

The aim of the current study is to critically evaluate self-report measures of social media use against objective measure of social

media use. Specifically, the primary aim of the study was to examine the degree of association between a single self-estimate measure of social media use commonly employed across prior research, against an objective measure of mobile social media use in a sample of both Android and iPhone users, as a key extension of previous research. As measures of problematic use are commonly employed in the literature, the study also examined the degree of association between a measure of problematic social media use and both self-estimate and objective social media use. This will also allow the present study to assess if problematic social media use may indeed be associated with time spent using social media or if the two are largely independent constructs. Specifically, this analysis will enhance our understanding of what factors the construct of problematic social media use encompasses and if it is more closely related to time spent using social media or perceptual factors relating to the disruptiveness of use. If self-report social media use does provide an accurate reflection of objective patterns of use, then the single estimate self-report social media use measure will show a moderate to strong positive association with objective social media use. Similarly, if problematic social media use provides a reflection of time spent using social media, then scores on a problematic social media use scale will demonstrate a moderate to strong positive association with an objective social media use measure. However, if, as per converging findings of Verbij et al. (2021), individuals are not able to accurately report on their social media use, then this would be reflected in a low and/or non-significant relationship between both self-report measures with objective social media use. These findings will directly inform the validity of a range of past findings and inform appropriate measures for future research.

### 1.1. Methods

#### 1.1.1. Participants

Recruitment for this study took place via the Curtin University undergraduate participant pool in addition to social media and word of mouth advertising. A total of 212 participants (159 female, 38 male, 15 not specified) with ages ranging from 17 to 52 ($M = 22.39$, $SD = 5.90$) were recruited to the study. This study received ethics approval from the Curtin University Human Research Ethics Committee (Approval number: HRE2017-0060).

### 1.2. Measures

#### 1.2.1. Single estimate social media use measure (self-estimate SMU)

To obtain a measure of self-report social media use that provides a direct comparison to objective data, participants were asked to estimate their average weekly mobile social media use. The question specifically directed participants to make this estimate and respond without checking their smartphone or referring to any other data regarding their actual use. The question was presented to participants as follows: "On average, how many hours a week do you think you spend viewing social media on your phone?". This number was then converted to minutes.

#### 1.2.2. Problematic use of social networking scale (PUSNS)

To assess relationships between indicators of 'problematic' social media use and both subjective and objective indicators of use, the present study included the problematic use of social networking scale (PUSNS; Vernon et al., 2015; Vernon et al., 2016). The scale is designed to measure the extent to which individuals engage in maladaptive social media use. The PUSNS is comprised of four items which participants respond to using a 5-point Likert scale that ranges from 1 (completely disagree) to 5 (completely agree). Each item consists of a statement such as "I prefer to spend my time on social media rather than social activities/events" or "I use social media as a way of making me feel good". The mean of the four items is used to score this measure, with scores ranging from 1 to 5.

#### 1.2.3. Objective social media use measure (objective SMU)

The objective measure of mobile social media use was screentime spent using Facebook, Instagram, Snapchat, Twitter and Tik Tok over the past week (no less than 6 days). These platforms were selected as they represent the five most popular social media platforms globally, excluding platforms designed primarily for direct messaging, streaming longform video content, blogging, and forums (Digital 2021: Australia, 2021). Usage data for these platforms was automatically recorded by participants' smartphones. For iPhone users this was done via the screentime function in settings (available from iOS 12 onward; Albergotti, 2019). Upon signing up to the study iPhone users were instructed to disable the "share across devices" function one week prior to their data collection session to ensure only smartphone data was recorded). Participants who used Android smartphones were directed to download the application 'App Usage', at least one week prior to the data collection session. The final measure was then calculated as the combined minutes spent using Facebook, Instagram, Snapchat, Twitter and Tik Tok via smartphone across the past 7 days.

### 1.3. Procedure

Upon sign up to the study (prior to participation) iPhone users were instructed to ensure the screentime function in settings was enabled and Android users were instructed to install the App Usage Application at least one week prior to the participant's scheduled data collection session. Participants then attended their scheduled data collection session at the lab where they met with the researcher. The participant then read the study information sheet and provided informed consent. Following this the participant was directed to complete a series of questionnaires including the self-report measures of single estimate social media use measure and the PUSNS. Participants were instructed not to refer to their smartphones during this portion of the study. Upon completion of the questionnaires the researcher then directed the participant to locate the objective social media use data in their smartphone, which was then recorded by the researcher. At the conclusion of the session participants were provided an opportunity to raise questions and thanked for their time. Owing to variation in COVID-restrictions over the duration of the study, a portion of the sessions were conducted in a remote face to face format, in which the participant met the researcher via videoconference rather than in person.

### 1.4. Results

#### 1.4.1. Data screening and filtering

All participants who consented to participate in the study completed their participation, (i.e. there were no withdrawals from the study). Of the 212 participants recruited to the study, three were excluded on the basis of not having at least 6 days' worth of social media data. Following these exclusions there was no missing data in the final data set. The final data set therefore comprised 209 participants (157 female, 37 male, 15 not specified). Four univariate objective SMU outliers were identified as falling more than three standard deviations above the mean. These data points were winzorised with each outlier converted to one value higher than the next most extreme score. Additionally, four univariate single estimate SMU outliers were identified and winzorized via the same process.

### 1.5. Preliminary analyses

Descriptive statistics for the key variables of interest, including a breakdown of gender distribution and individual social media platform use, were calculated and are presented in Table 1. While the proportionately larger number of iPhone compared to Android users suggest caution in interpreting comparative usage patterns, we also conducted exploratory analyses to examine whether any differences exist between patterns of social media use for each platform across operating systems

**Table 1**

Mean and Standard Deviations for Single Estimate of Social Media Use in minutes (one-week), Problematic Use of Social Networking Scale, and Objective Social Media Use (one-week).

|  | Total Sample | iPhone | Android | *t, p* |
|---|---|---|---|---|
| *N* | 209 | 163 | 46 | |
| Gender (m/f/ns) | 157/37/15 | 127/26/10 | 30/11/5 | |
|  | M (*SD*) | M (*SD*) | M (*SD*) | |
| Age (years) | 22.39 (*5.90*) | 22.15 (*5.96*) | 23.22 (*5.66*) | −1.08, 0.28 |
| Single Estimate SMU | 1253.28 (469.30) | 1241.21 (473.94) | 1296.04 (454.96) | −0.70, 0.49 |
| PUSNS | 2.23 (0.70) | 2.23 (0.68) | 2.22 (0.76) | 0.08, 0.94 |
| Objective SMU | 937.10 (626.87) | 951.06 (580.39) | 887.63 (774.93) | 0.61, 0.55 |
| Objective Facebook | 189.82 (318.68) | 168.10 (215.86) | 266.80 (542.12) | −1.87, 0.06 |
| Objective Instagram | 338.11 (487.00) | 368.47 (531.35) | 231.85 (258.87) | 1.69, 0.09 |
| Objective Snapchat | 148.99 (283.84) | 155.28 (203.81) | 126.49 (472.93) | 0.60, 0.55 |
| Objective Twitter | 48.42 (172.06) | 37.16 (143.04) | 86.33 (247.17) | −1.79, 0.08 |
| Objective TikTok | 245.89 (343.15) | 255.48 (340.59) | 212.30 (353.70) | 0.75, 0.45 |

*Note: f = female, m = male, ns = not specified, Single-estimate SMU = Single-estimate Social Media Use, PUSNS = Problematic Use of Social, Networking Scale, Objective SMU = Objective Social Media Use.*

(Android vs iPhone). This revealed that there were no significant differences in age or platform use dependant on type of device used. However, more Twitter and Facebook use occurred via Android devices with more Instagram use occurring via iPhones in the current data set. Results from these analyses are presented below in Table 1.

*1.6. Comparison of objective and subjective social media use*

A paired sample *t*-test was conducted to compare self-reported single-estimate SMU against the objective SMU. There was a statistically significant difference between the groups, $t(211) = -5.727$, $p < .001$, $d = 0.58$, showing that the self-reported single-estimate SMU was significantly greater than mean objective SMU (see Table 1 for means). This indicates a general tendency among participants to overestimate their social media use on self-report measures, consistent with findings by Ellis et al. (2019) and Verbij et al. (2021).

*1.7. Association between self-report measures and objective social media use*

To determine the degree of association between variables correlation analyses were conducted. To permit examination of the relative likelihood that any significant effects represent a genuine association, or that non-significant effects represent the genuine absence of a relationship, analyses also included Bayes factors. We adopted the conventional interpretation of Bayes factors whereby values 1–3 suggest weak evidence in favour of the hypothesis, values 3–10 indicate moderate evidence, and values > 10 suggest strong evidence in favour of the hypothesis (van Doorn et al., 2021). Similarly, values 0.33–1 indicate weak evidence in favour of the null hypothesis, values 0.1–0.33 suggest moderate evidence, and values < 0.1 indicate strong evidence in favour of the null hypothesis (van Doorn et al., 2021).

Age and gender were included as covariates in all correlational analyses. There was no significant association between single estimate self-report social media use with objective SMU. The results of this analysis is presented in the correlation matrix in Table 2. In line with conventional interpretation of the Bayes factor for this analysis, this would indicate strong evidence in favour of the null hypothesis ($BF_{10}$ 0.03–0.1; van Doorn et al., 2021), suggesting strong evidence in favour of the absence

**Table 2**

Correlations of Single Estimate of Social Media Use (one-week), Problematic Use of Social Networking Scale, and Objective Social Media Use (one-week) including Bayes factors.

|  | Single Estimate SMU (minutes) | PUSNS |
|---|---|---|
| PUSNS | r = .08, p = .25, $BF_{10}$ = 0.13 | |
| Objective SMU (minutes) | r = .04, p = .58 $BF_{10}$ = 0.18 | r = .19, p = .01 $BF_{10}$ = 3.04 |

of a relationship between self-report social media use and objective social media use. A weak significant correlation between the PUSNS and objective SMU was observed (see Table 2). Bayes factors for this analysis suggest moderate evidence ($BF_{10}$ 3–10) in favour of the presence of a relationship between problematic social media use and objective social media use. These findings do not support single estimate self-report measures of social media use as sharing even a weak relationship with objective measures of social media use. Whilst a significant correlation between the PUSNS and objective use was found, the degree of shared variance ($R^2 = 0.032/3.2\%$) indicates very low concordance between the two variables.

*1.8. Discussion*

Social media use research continues to be dominated by self-report measures that many researchers have argued may have limited utility (Griffioen et al., 2020; Valkenburg, 2022). Little research has sought to evaluate the association between commonly employed self-report measures and actual social media use. The current study sought to address this issue by evaluating associations between a single estimate self-report measure, a measure of problematic social media use (PUSNS), and objective mobile social media use. The findings showed no significant relationships between single estimate self-report social media use and objective social media use, while showing a weak, significant relationship between the PUSNS and objective social media use. Examination of Bayes factors indicated that the non-significant association between the single estimate self-report social media use and objective social media use was more likely to indicate the absence of a relationship between the variables under examination rather than the failure to detect an effect. While the Bayes factor for the relationship between the PUSNS and objective social media use suggested moderate evidence in favour of the relationship, the degree of shared variance between the measures (3.2%) suggests these two measures are largely independent constructs. These findings are broadly consistent with converging research examining the concordance between self-report and objective measures of smartphone use (Ellis et al., 2019). The findings of this study have implications for both future social media use research methodologies and interpreting the findings of existing research.

The apparent absence of a relationship between the single estimate measure of social media use and objective social media use suggests that single estimate self-report measures may be unable to accurately capture objective social media use. These findings therefore suggest that subjective estimates of social media use and objective use may be largely unrelated constructs. This indicates that researchers cannot assume that self-report measures of social media use provide a valid indication of actual use, and it will therefore be critical for any such measures to be appropriately validated against actual use in future research. Similarly, it highlights the potential importance of utilising available objective measures of social media use. This is consistent with findings of a recent meta-analysis examining discrepancies between objective and self-report digital media use (Parry et al., 2022). The meta-analysis found only moderate correlations between self-report and objective use, and even weaker correlations between objective and problematic use measures (Parry et al., 2022). The findings of the present study build on this existing research, suggesting more specific measures of use (i.e. social media and indeed specific SMU platforms) may show even lower

reliability than general use measures. Beyond implications for future research, these findings have potentially major implications for the veracity of current findings regarding relationships involving social media use. Specifically, many outcomes that previous research has associated with social media use may only reflect *perceived* use, as distinct from actual use. In line with this Sewall et al. (2020) found that estimated social media use shows stronger correlations with wellbeing variables compared to actual use. This further highlights that our understanding of how objective social media use affects mental health and wellbeing may be relatively limited given the heavy reliance of much past research on self-report. It will be important for future research to replicate or corroborate such existing findings regarding relationships of social media use with other (e.g. mental health) variables using objective measures, in light of the findings of the current study.

Our knowledge of the factors that influence perceived social media use also remains limited. Sewall et al. (2020) suggests that self-report estimates may in fact be more strongly associated with wellbeing variables than actual use. This may be supported by studies such as those highlighted in the systematic review conducted by Keles et al. (2020) which associated self-reported social media use with wellbeing factors including anxiety, depression, and psychological distress. Given that much of the existing research suggesting associations between higher social media use with negative outcomes on wellbeing variables have relied exclusively on self-report, some of these associations may be an artifact of common underlying factors (e.g. worry). It is possible, for example, that wellbeing, anxiety, and stress may shape perceptions and concerns regarding social media use. As such, some associations involving self-report social media use may have more to do with the factors shaping individuals' concerns and perceptions of social media use rather than social media use itself. This is supported by concerns raised by Parry et al. (2022), which indicate self-report social media use measures are associated with a number of perceptual biases. As such it will be important to for future research to establish whether associations between self-report SMU and indicators of emotional wellbeing are also corroborated via objective measures.

The participants in the current study demonstrated a tendency to overestimate their social media use in single estimate self-report measures as per previous findings examining broader smartphone use measures and those measuring use of specific social media platforms in adolescents (Ellis et al., 2019; Verbij et al., 2021). However, of greater concern was the striking lack of relationship between self-report and objective use. If participants *consistently* overestimated use, this would permit relatively simple correction by researchers between estimated and actual use. The lack of relationship however suggests that self-report cannot be relied upon to provide an estimate of actual social media use, with objective measures being a more critical feature of research examining relationships involving social media use.

The weak, significant relationship between problematic social media use as assessed by the PUSNS and objective social media use in this sample suggests that problematic social media use may also be a largely distinct construct from objective social media use. It will be critical for research examining problematic social media use in the future to be careful to not conflate the two, and to clearly justify interest in examining 'problematic' use that may itself be unrelated to actual use. Given the variety of problematic social media use scales currently employed, it is possible that some may demonstrate stronger (or indeed some) association with objective social media use. The present findings highlight that such subjective measures cannot be assumed to reflect objective use and reinforce the need for any self-report measure to be first validated against behavioural data before such conclusions can be drawn.

It is important to acknowledge a number of limitations in the present study. One concerns the inability to account for social media use via other devices (e.g. Computer). While the estimate of social media use was designed to directly correspond to the objective measure examined by asking participants to estimate use via their mobile device, it is possible that participants may be better able to estimate their total social media use overall. However, given the small proportion of social media use that typically occurs via these devices and factors such as the accessibility of use via smartphone, it is unlikely that not accounting for this use will have systematically skewed the relationship/s observed (Tankovska, 2021). Nevertheless, it may be of interest for future research to corroborate the present findings by examining associations between problematic social media use and total objective social media use, perhaps by incorporating browser data. It must also be acknowledged that objective measures may not always be accurate due to various factors that could potentially compromise or skew data (eg. bugs, operating system inconsistencies, software updates, etc.)

Finally, the data collection method used in this study was time and resource intensive and may not be practical for large scale studies. The benefit of the current approach was that the quality of data could be confirmed to minimise participant errors in locating the correct data screens to record. However, data donation methods such as that proposed by Baumgartner et al. (2022), involving participants sending screen recordings of usage data, may be a more time efficient strategy to collect large samples of data.

The present study sought to compare one of the most commonly utilised self-report measures of social media use in the form of a single self-estimate against objective use. However, given the breadth of self-report measures currently in use, including the many that adopt an addiction model of social media use, the present study cannot inform the relative validity (or lack thereof) of such measures in reflecting objective social media use. It is possible that some formats of self-report measures (e.g. more frequent self-estimate intervals, or usage prompted self-report) and problematic use scales may be more reflective of objective use than the measures assessed in this study. However, as highlighted by the present findings, it will be critical to validate such scales against objective measures to confirm that they do in fact reflect the behavioural processes that they claim to assess.

## 2. Conclusions

In sum, the findings of this study suggest that self-report social media use measures are not reflective of objective social media use. In recent years, technology has developed such that objective social media use data has become significantly more accessible. As such, it will be critical for ongoing social media research to reduce reliance on self-report measures that have dominated the field, towards more objective measures of social media use.

## Author statement

**Tamsin Mahalingham:** Conceptualization, Methodology, Formal Analysis, Investigation, Data Curation, Writing - Original Draft, Writing – Review and Editing; **Patrick J. F. Clarke:** Conceptualization, Methodology, Software, Writing – Review and Editing, Supervision; **Peter McEvoy:** Writing – Review and Editing, Supervision.

## Data availability

data has been uploaded to an OSF and is available via this link: https://data.mendeley.com/datasets/x3wxfycggn/1

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