

Understanding and measuring mobile Facebook use: Who, why, and how?

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Abstract

Although social media are increasingly used through mobile devices, the differences between mobile and computer-based practices remain unclear. This study attempts to tease out some of these differences through multiple analytical strategies and samples. Drawing on theoretical expectations about the affordances, motivations, and cognition of mobile use, we investigate *who* uses mobile Facebook, *why* they use it, and *how* they use it. To do this, we first compare those who use Facebook only on a PC with those who also use the service on mobile devices. Then, in order to quantify *mobile Facebook use*, we propose a new set of survey measures to tap into more and less mobile users among the sample of people who access Facebook through multiple modes. These questions serve to validate measures of mobile Facebook use, and allow us to examine how patterns of use relate to user motivations and experiences. Findings revealed important differences between PC-only and mobile users as well as a distinct and reliable measure of *mobileness*. Whereas motivations for Facebook use did not differ across users, more habitual and absorbing use of Facebook was strongly, positively associated with mobile

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practices. These findings illustrate that people use mobile Facebook in more automatic and immersive ways that are independent of overall frequency of use or motivations. Implications for the psychological mechanisms involved in mobile communication, as well as survey measurement of social media use, are discussed.

Keywords

demographic differences, habits, immersion, measurement, mobile Facebook, motivations, national sample, social media use

Online communication may have developed and matured on “desktop” computers, but the sociotechnical landscape has changed dramatically over the last two decades. In addition to personal computers, individuals now access social media platforms through a variety of other devices including tablets, phablets, smartphones, and smartwatches. The increasing range of sources calls into question our extant understanding of social platforms that traditionally operated on personal computers—such as Facebook. Indeed, an extensive body of research has examined how Facebook use relates to different aspects of our lives ranging from psychological well-being (e.g., Elphinston & Noller, 2011; Kross et al., 2013) and student performance (e.g., Junco, 2012; Pasek, more, & Hargittai, 2009) to social and political resources (e.g., Ellison, Steinfield, & Lampe, 2007). As of now, however, researchers have largely failed to consider how the specific device (e.g., computer vs. smartphone) and current context (e.g., home vs. away) alter user engagement (Bayer, Ellison, Schoenebeck, Brady, & Falk, in press; Kuru & Pasek, 2016; Murthy & Lewis, 2015).

Given the increasing use of Facebook on more portable devices, this study attempts to conceptualize, measure, and understand key correlates of *mobile* social media use as a distinct phenomenon. This is important because more than half of the site’s ad revenue now comes from the mobile arena (Crum, 2013; Goggin, 2014), a trend that is fueled by and is reflective of the rise of location-based apps of Facebook (Wilken, 2014). A study by the Pew Internet and American Life Project found that 40% of mobile phone users in the US accessed social networking sites (SNSs) through their handsets in 2013. A more recent study found that 91% of 18- to 29-year-olds and 77% of those in the 30–49 age group reported accessing SNSs through a mobile phone (Smith & Page, 2015). Nonetheless, the rise in mobile Facebook activity is not especially surprising given that mobile telephony was the fastest spreading communication technology in history (Castells, 2009; see also Smith & Page, 2015).

This transformation also raises questions about the implications of mobility for social media platforms more generally.¹ Our primary question is whether mobile social activities constitute a unique type of user engagement, particularly when holding constant the specific platform of interest. In the current case, we examine how using Facebook through mobile devices compares to more traditional computer-based access through desktop and laptop machines. Our approach is two-tiered; we first compare PC-only and mobile users of Facebook, we then contrast how mobile Facebook users vary amongst

themselves. As part of this theoretical comparison, we develop discrete measures of “mobileness,” validate them, and run analyses to understand the characteristics, motivations, and perceptions of mobile Facebook users.

Why mobile matters

Mobile communication theory provides a number of insights into the contemporary use of Facebook across devices. The most fundamental affordance of mobile communication is that it provides a social experience that is not bound by traditional spatial limitations, or what has recently been termed “portability” (Ling, 2004; Ling & Campbell, 2009; Schrock, 2015a). This is because mobile phones are small and they operate on networks that are nearly ubiquitous. As a result, people carry and wear mobile media almost everywhere and often use them while they are moving about and are otherwise engaged in daily life activities. Due to their compactness and connections to ubiquitous networks, mobile media produce practices that even portable media—such as laptops and even tablets—cannot replicate. Although portable media are carried from place to place in a manner similar to mobile devices, their use is limited to places with requisite infrastructure, work surfaces, and network access. In that sense, both laptops and fixed computers tether users to a location (or at least a context) during use, whereas truly “mobile” media allow for the possibility of being untethered (Campbell, 2013).

Mobile versions of social media platforms are also designed with unique interfaces that separate them from the browser versions accessed on personal computers. Beyond a smaller application window and touchpad features, mobile clients often leverage what Schrock (2015a) terms “locatability” (they track location) and new forms of “multimediality” (see also Marvin, 2013).² In other words, mobile devices allow users to virtually engage with physical environments through GPS tracking and can be used synchronously with other activities and applications. Altogether, mobile devices offer potential user experiences that may differ from those of nonmobile media. Indeed, previous research showed differences in user motivations, experiences, and other social consequences when people use the Internet either on PC or mobile platforms (see Miyata, Boase, Wellman, & Ikeda, 2005). In particular, mobile Internet use is more popular among younger people and relied upon for connecting with faraway friends and strong ties (Miyata et al., 2005), and users report greater intrinsic enjoyment (Okazaki, 2009).

For these reasons, mobile Facebook has the potential to be used in ways that separate it from more sedentary Facebook use. Individuals who use social media on mobile devices might have experiences that are more interactive, particularly in ways that reinforce habitual practices (LaRose, 2015). Further, the “near-synchronous” (Rettie, 2009) social interaction allowed by mobile devices might fuel this interactivity by facilitating quick back-and-forths. For example, sharing a selfie on Facebook while one is trekking may produce likes and comments repeatedly every few minutes, thus facilitating a feedback loop. Moreover, the anytime-anywhere access of mobile communication allows for the tightening of information and communication flows among network ties, as those flows are weaved into the moments of everyday life activities and movements (Ling, 2008). In these ways, mobile Facebook practices have the potential to constitute a thicker and more interactive user experience.

Conceptualizing mobile social media

Do mobile versions of online platforms represent a new type of social interaction, or simply a new context for the same social experiences? Our approach directly compares, empirically, the use of personal computers and mobile devices within a common platform: Facebook. And there is good evidence that the affordances of mobile social networking applications differ from those of their classic desktop cousins (Schrock, 2015a). This might be especially likely for Facebook, where a large portion of users have shifted from primarily-PC to primarily-mobile (Goggin, 2014; Wilken, 2014). For example, mobile-specific geo-tagging features have changed how users share their photos (Humphreys & Liao, 2011). Likewise, the rise of selfies highlights the special possibilities of mobile-first and mobile-specific platforms, such as Snapchat and Instagram (Bayer et al., in press; Katz & Crocker, 2015; Schleser, 2014). Indeed, Schrock (2015b) recently conceptualized such mobile-heavy social network sites as a discrete entity, or mobile social network platforms (MSNPs).³

An alternative way to understand MSNPs is to shift the lens from the platforms toward their users. There are at least two ways of studying users under this light. On one hand, we can look at the composition of mobile versus nonmobile users. This could provide initial insights into the fundamental user differences across devices. On the other hand, we can focus on variations in amount of mobile use among users who access these platforms through multiple devices. Despite established literatures on social media and mobile communication separately, there has been scarce research directly untangling the device (smartphone) from the platform (Facebook).⁴ If there is indeed a quantifiable construct of “*mobileness*” in social media use, we can develop survey measures designed to capture the mobile-versus-PC differences.

Comparing Facebook users: Who, why, and how?

At the most basic level, we compare PC-only and mobile users of Facebook to determine whether there are demographic and basic site usage differences (RQ1). Large national studies such as those conducted by the Pew Internet and American Life Project identify demographic correlates of both for social media use and mobile media use (e.g., Matsa, 2016; Smith & Page, 2015). These works suggest that age, education, and income might especially be important predictors of mobile Facebook use (cf. Perrin, 2015), but these factors have not been jointly studied. Most significantly, these previous reports do not control for variables in a multivariate context.

Next, in order to measure more nuanced differences of mobile use among those who have mobile Facebook accounts, we developed three measures of “*mobileness*”: (a) user perceptions regarding the relative degree of mobile versus PC use of Facebook, (b) difference scores of mobile versus PC versions of identical Facebook practices, and (c) ratio scores of mobile versus PC use versions of the same Facebook activities.

Within our comparison of “more mobile” and “less mobile” users, we first focus on *why* people use Facebook, or the motivational reasons for differential usage. Because of the affordances described before, users may differ in their goals and motivations for engaging with Facebook. As popularized by uses and gratifications (U&G) research tradition, people

use media actively in order to gratify various needs such as surveillance, escape mechanism, passing time, voyeurism, companionship, arousal, etcetera (Blumler, Katz, & Blumler, 1974; Palmgreen, Wenner, & Rayburn, 1980). Similar to the view of the technology acceptance model (TAM; see Davis, 1989; Kwon & Chidambaram, 2000), people first perceive the action possibilities of a technology in order to use it for a specific purpose. Hence, we consider whether different types of motivations might drive Facebook use via mobile (vs. PCs).⁵

More precisely, we test three common motivations for using social media: the use of mobile Facebook for information, entertainment, and social connection purposes. Although not exhaustive, these motivations for use are widely studied in the literatures on both the traditional and new media (e.g., Campbell & Kwak, 2011; Palmgreen et al., 1980; Shah, Kwak, & Holbert, 2001). Thus, they serve as a useful entry point for clarifying what motivations might be associated with mobile, as opposed to web-based, Facebook use.⁶ Given that many people report using Facebook to obtain political and daily news through their social media newsfeed (Mitchell, Gottfried, & Matsa, 2015), and play to built-in games (Lenhart, 2015), among countless other activities, it stands to reason that all three motivations are likely to influence why people spend time using Facebook on their mobile devices (vs. PCs). We are interested in whether these motivations are weighed differently by more mobile users of Facebook (RQ2).

We then turn to *how* individuals use Facebook on mobile devices. Focusing on the manner in which people use Facebook may help to reveal what is different about mobile behavior beyond explicit motivations. We concentrate on two forms of media cognition—habitual and immersive use—following theoretical arguments that mobile affordances interact with core cognitive processes in novel ways (e.g., Bayer, Campbell, & Ling, 2016). Whereas habits are considered a form of less conscious or automatic behavior (i.e., “automaticity”), immersion is viewed as a more conscious or attention-consuming phenomenon (Bayer, Dal Cin, Campbell, & Panek, 2016; Humphreys, von Pape, & Karnowski, 2013).⁷ As media become embedded within daily life, the behaviors associated with those media have the potential to turn into more rehearsed and routinized patterns (see LaRose, 2010, for a review). Mobile affordances, in particular, provide users with a wider range of contexts to develop habitual triggers or “connection cues” (Bayer, Campbell, et al., 2016), along with more opportunities to check their accounts for instant emotional rewards (LaRose, 2015; Oulasvirta, Rattenbury, Ma, & Raita, 2012). For these reasons, the ubiquity and interactivity of mobile devices might encourage stronger habit formation, as compared to desktop use (H1).

Mobile practices might also be more intense and encapsulating, and hence *immersive*, by allowing users to engage with their surrounding contexts (Humphreys et al., 2013). For example, users might experience strong emotional moments that prompt them to share photos *immediately*. Indeed, the freedom to share an experience in the present is markedly different from uploading photos on their PCs at the end of the day or a holiday trip. A recent study illustrated how users attain unique social experiences—what the participants describe as being part of the “pseudo-aural space,” “mobile intimacy,” and “self-expediential social networks” when they engage through mobile devices (Lee, 2013). Other research suggests that mobile social media can engender deeper feelings of connectedness and belongingness (Quinn & Oldmeadow,

2013). The potential for magnified cognitive involvement is also highlighted by recent surge in live broadcasting and virtual mobile gaming.⁸ Altogether, extending past theoretical work (Burchell, 2015; Schrock, 2015b), we suggest that interactions on mobile (vs. PC) devices may be viewed as more engrossing given their increased proximity to “offline” experiences (H2).⁹

Methods

Data

Data for the current study were collected from two samples. One data set was collected as part of a panel study with a large national sample of Americans collected by Qualtrics. Data on 818 respondents was collected in December of 2014. The second sample consisted of 203 undergraduate students at a large Midwestern university who received course credits in exchange for their participation and the responses were collected between February and March, 2015.¹⁰ Refer to online Appendix A for the full demographics of both samples.¹¹

Measures

Please see the details about questions, response options, and how they are computed in Table 1. Please see online Appendix B for univariate descriptive statistics and online Appendix C for the reliabilities.

Analytical procedures

First we treated PC-only versus mobile users of Facebook as a categorical outcome variable (0 = PC-only, 1 = mobile user) and predicted it via binary logistic regression in order to observe the patterns in the multivariate context (when controlling for a set of variables). We then examined correlations and box plots while validating the nuanced mobile Facebook measures (difference, ratio, and level of mobile use scores). Finally, we used ordinary least squares (OLS) regression for models predicting users’ mobile Facebook use.

Results

Differentiating PC-only and mobile users

A binary logistic regression tested the model predicting the odds of being a mobile Facebook user as opposed to being a PC-only Facebook user (McFadden $R^2 = .27$, online Appendix D). To better interpret the results, we computed the predicted probabilities of being a mobile Facebook user across the lowest (circles) and highest (triangles) scores for these variables as seen in Figure 1. Age, income, and Facebook tenure accounted for large differences in predicted mobile Facebook use. The predicted probability of being a mobile Facebook user at lowest age in the sample was 69%, whereas it was 20% for lowest income, and 35% for longest time of being a Facebook user (Facebook tenure) for any

Table 1. Measures used and computed in the study with details.

Variable	Details
FB account	Yes/No
Smartphone owner	Yes/No
Access Facebook on mobile	Yes/No
Time spent on Facebook	“0–10 minutes”; “10–30 minutes”; “30–60 minutes”; “1–2 hours”; “2–3 hours”; “More than 3 hours”
Level of mobile FB use	Do you tend to use Facebook more on a computer or a phone? “I only use Facebook on a computer”; “I mostly use Facebook on a computer”; “I use Facebook on a computer slightly more often than on a phone”; “I use Facebook the same amount on a computer as on a phone”; “I use Facebook on a phone slightly more often than on a computer”; “I mostly use Facebook on a phone”; “I only use Facebook on a phone.”
FB use frequency	“Check your account”; “Post something”; “Browse the newsfeed”; “Send private message using Facebook chat” (asked separately for mobile and PC). 7 response options; “Less than once a week” to “More than once an hour.”
Mobile-PC difference score index	$[\sum_i [B - A]] / 4$, where $i = 1, 2, 3, 4$
Mobile ratio score	$[B / (A + B)]$

Note. All measures have been recoded to range from 0 to 1 to make it easier for numerical comparison in the descriptive and inferential analyses. Please see online Appendices B and C for further details.

prototypical respondent.¹² Overall time spent on Facebook, habit, and immersion were also related to usage patterns, though these did not meet traditional standards of statistical significance. Altogether, these results help us understand the differences between mobile and PC-only users (RQ1).¹³

Differentiating amongst mobile Facebook users

Focusing on variance among individuals who use mobile Facebook, we show what appears to be a distinct “*mobileness*” dimension of social media use. The zero-order correlations in Appendix G indicate that our three key measures of mobile social use were closely related to one another. The intercorrelations ranged from moderate to strong; the lowest one is between level of mobile use and difference score ($r = .44$) whereas the highest correlation is between difference and ratio scores of mobile use ($r = .80$; Appendix G). Looking at how three mobile Facebook measures relate to key Facebook measures, we did not see significant patterns.

Comparing the three measures (difference, ratio, and mobile level scores) also reveals how respondents perceive their Facebook use. Whereas level of mobile use (the respondent perception) correlates negatively with PC frequency ($r = -.22$) it does not correlate

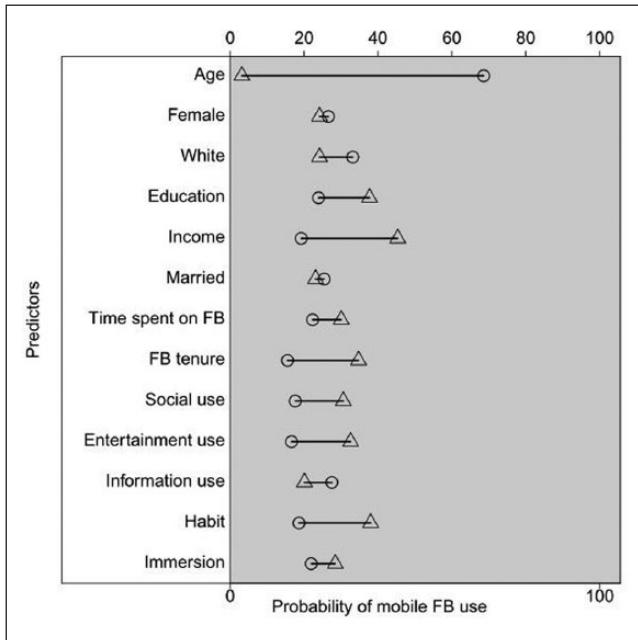


Figure 1. Predicted probabilities of mobile Facebook use (Qualtrics sample).

Note. Circles represent the outcome score (predictive probability of being mobile Facebook user) for the lowest score in each predictive variable whereas triangles represent it for the highest score in the predictive variable.

significantly ($r = .08$) with mobile frequency (Appendix E), suggesting that respondents anchor their *level of mobile Facebook use* response on their PC use frequency. To investigate how perception item and frequency measures relate to one another, we created boxplot (Figure 2) showing the means and confidence intervals of difference score and ratio score measures at each level of the “level of mobile use of Facebook” question. This boxplot indicates that respondents’ perceptions of the relative amount of mobile versus PC use closely mirror other measures of these constructs, thus providing criterion validity. It is seen that for both difference (Figure 2, left) and ratio scores (Figure 2, right), the positive trend of means going from left to right reveals the expected increasing pattern. At the extremes of the response scale of level of mobile use, however, we see that means are incongruent with the expected match between perception and behavioral items that tap *mobileness*.¹⁴

The mobile Facebook measures also relate with other, more specific Facebook use measures. Both difference and ratio measures positively correlate with habit ($r = .18$ and $.19$, respectively) and immersion ($r = .24$ and $.22$, respectively), whereas only ratio relates positively to motivations of Facebook use for social connection and information (see online Appendix E). Overall these findings provide evidence that mobile use is a reliable, distinct, and predictable aspect of Facebook use.

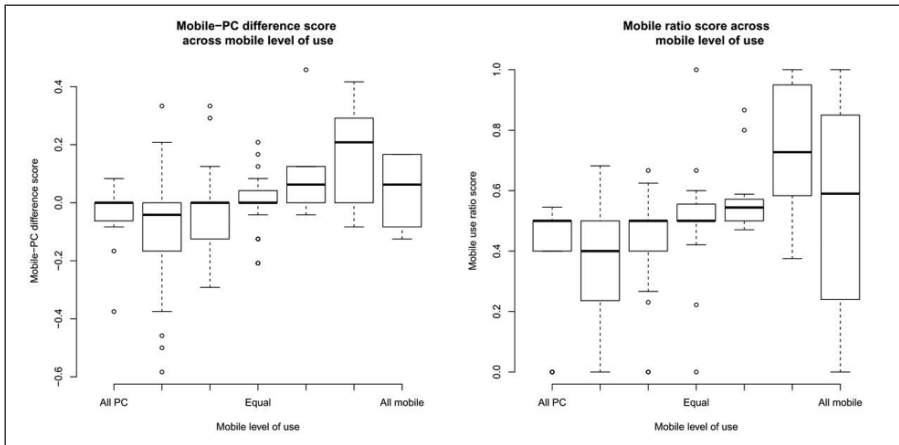


Figure 2. Boxplots for difference and ratio scores across levels of mobile use.

Predicting level and frequency of mobile Facebook use among mobile Facebook users

Motivations for Facebook use. Motivations for using Facebook, be it social connection, entertainment, or information purposes, did not predict mobile Facebook use across the three measures. The only notable effect is the positive association between entertainment use and the level of mobile Facebook use, although this effect is only approaching significance ($b = .17$, $SE = .09$, $p = .058$, Table 2). The significant patterns for social connection and entertainment motivations observed in the logit prediction of *being a mobile user* did not replicate with *the degree* of mobile use (RQ2).

Patterns of use: Habit and immersion. Both habitual use and immersive use of Facebook, controlling for all other variables, significantly predict mobile Facebook use across multiple measures, although this is more consistent and strong for immersion than habitual use. As seen in Table 2, habit significantly predicts greater mobile difference ($b = .12$, $SE = .05$, $p = .02$) and mobile ratio score ($b = .17$, $SE = .05$, $p = .02$); however it does not relate to level of mobile use ($b = .07$, $SE = .08$, $p = .37$). In contrast, we see that immersion is more strongly related to mobile level ($b = .14$, $SE = .08$, $p = .11$),¹⁵ mobile difference ($b = .17$, $SE = .05$, $p < .001$), and ratio as well ($b = .20$, $SE = .07$, $p = .005$). These results lend support to both H1 and H2.¹⁶ For the replication on the student sample, please see online Appendix I.

Discussion

Social platforms such as Facebook have been “mobile” for some time now, but empirical research on social media continues to be remiss in isolating the discrete implications of mobility. In response to this state of the literature, the current study presents novel

Table 2. Predicting mobile use of Facebook by motivations, habit, and immersion via OLS regression (Qualtrics sample).

		Model 2		Model 3		Model 4	
		Coef.	SE	Coef.	SE	Coef.	SE
Mobile level (N = 195)	Social connection use	-.10	(0.10)				
	Entertainment use	.17+	(0.09)				
	Information use	-.03	(0.08)				
	Habit			.07	(0.08)		
	Immersion					.14	(0.08)
	R²	.13		.12		.13	
F test	F(3) = 1.25			–		–	
		Coef.	SE	Coef.	SE	Coef.	SE
Mobile difference (N = 195)	Social connection use	.05	(0.06)				
	Entertainment use	-.04	(0.06)				
	Information use	.06	(0.05)				
	Habit			.12*	(0.05)		
	Immersion					.17***	(0.05)
	R²	.09		.10		.13	
F test	F(3) = 0.92			–		–	
		Coef.	SE	Coef.	SE	Coef.	SE
Mobile ratio (N = 174)	Social connection use	.13	(0.08)				
	Entertainment use	-.08	(0.08)				
	Information use	.09	(0.07)				
	Habit			.16*	(0.07)		
	Immersion					.20**	(0.07)
	R²	.18		.18		.19	
F test	F(3) = 1.72			–		–	

Note. Outcome variables are mobile level, mobile-PC difference, and mobile-PC ratio. Model 2 tests motivations, Model 3 tests habit, and finally Model 4 tests immersion. All models here control for the variables that are included in Model 1; see online Appendix H for complete results.

†p lower than .10. *p lower than .05. **p lower than .01. ***p lower than .001 (two-tailed).

self-report measures of *mobile* social media use, along with evidence for their validation. Perhaps most crucially, these results reaffirm the need to explicitly measure and control for device of use in measures of social media use (Kuru & Pasek, 2016). All three measures of mobile social media use were found to be consistent, cross-validating each other, and correlating with other key Facebook use measures. More specifically, the strong correlations between the perception item (level of mobile FB use) with the other two frequency estimations indicate that it is an identifiable concept on its own and that it could be reliably and validly measured. This variable-centered approach at explicating

mobile social media use supports an affordance-based or process-based approach to studying social media. By pulling apart various mobile, portable, and sedentary practices within social media use through validated measures such as ours, future research can avoid confounding very different social processes.

Results revealed consistent demographic differences between PC-only and mobile users of Facebook, supporting the findings of recent survey reports (e.g., Smith & Page, 2015). This implies that most of the demographic differences might be related to the access and adoption of mobile technologies. Whereas such results might imply that what matters is the affordability of the mobile devices (see Rogers, 1962), other research has shown that *mobile-only* Internet users are actually more disadvantaged (unemployed, less income; see Taipale, 2014). Our additional analysis focusing only on smartphone owners still shows that those having higher income are more likely to access Facebook on their phones. As a whole, our findings affirm that mobile Facebook use is tied to expected demographic variables, but these surface-level characteristics fail to account for the full range of mobile differences.

Motivations, on the other hand, did not explain individual variation in mobile usage of Facebook when accounting for other variables. Based on past research (e.g., Bode, 2012; N. Park, Kee, & Valenzuela, 2009), we expected that there would be different motivations for using mobile (vs. PC) Facebook. Of course, smartphones come with numerous features and Facebook is only a small, albeit important, part of the package. Such motivations could play out in decision processes of obtaining a smartphone, creating a Facebook profile, or logging into a Facebook profile on one's smartphone (e.g., Wei, 2008). Indeed, the results comparing PC-only and mobile users suggest that this might be the case. Nonetheless, the failure of three common motivations to predict mobile-specific activity suggests that more research is needed to clarify how users conceptualize platform use across devices (cf. Humphreys et al., 2013).

By contrast, our results for habitual and immersive use point to substantial differences in how users engage with Facebook across devices. Both forms of use are positively related to greater mobile (vs. PC) activity, though the relationship is stronger for immersion. Previous research has demonstrated that automaticity is important to understanding the processes and phenomena associated with mobile communication (e.g., Bayer & Campbell, 2012). In the current case, we show that *more* mobile Facebook use (vs. *less* mobile use) is linked to increased perceived automaticity. This finding suggests that it is the mobility itself that matters, rather than divergence of mobile-first channels (e.g., texting) or raw time spent on a platform. Why is mobile Facebook associated with more automaticity than PC Facebook? Bayer et al. (2016) asserted that mobile media might facilitate more cognitive triggers—and thus higher overall automaticity—than other media due the wider range of contexts encountered. As such, the findings here support past theory linking automaticity to mobility.

Similarly, our results consistently showed greater immersive experiences of mobile Facebook use. Higher levels, frequencies, and ratios of mobile Facebook use were correlated with greater self-reported immersion. As mentioned before, previous work has argued that mobile affordances allow for a starkly different user experience (e.g., Farman, 2012; D.-H. Lee, 2013; Quinn & Oldmeadow, 2013). Mobile media are temporally and spatially closer to offline experiences, potentially amplifying cognitive engagement.

Given the more interactive and real-time user-friendly affordances of mobile devices (like geo-tagging, instant photo-applications, etc.), these results support the idea that being more proximal to offline experiences may enable higher immersion. At the same time, it is also feasible that the findings reflect a perceptual effect, as opposed to greater cognitive involvement in practice. In other words, mobile users may view Facebook as highly immersive since “on-the-go” use pulls them away from other activities. PC users, however, may perceive less of an absorption effect due to more confined usage.

Additionally, we shed new light on the relationship between habitual and immersive tendencies. Humphreys et al. (2013) found evidence for both immersive and extractive (more focused, outcome oriented) uses in mobile phone (e.g., spending time on social media vs. checking for directions on map). Recent research has also found that, despite their separate histories, automaticity and immersion are positively related in the case of mobile texting (Bayer, Dal Cin, et al., 2016). The robust connection between automatic and immersive engagement with social media, at least within mobile activities, can be contrasted with a motivational account of behavior. Comparing our null findings for motivations and significant results for habitual and immersive use, we provide some evidence that implicit cognitive orientations are more likely to supersede deliberative decision processes—at least in terms of how users distinguish more mobile practices on Facebook.

Beyond the implications discussed before, there are a couple of practical consequences of our findings. First, mobile Facebook use measures provide further insight into respondents’ perceptions of overall social network site use. We consistently found that respondents’ perceived level of mobile use is negatively related to total time spent on Facebook. This is an interesting finding when contrasted with the other mobile effects. Perhaps people use Facebook across devices in simultaneous or interspersed ways, and their conception of time spent is complicated. Or this could be related to the broader phenomenon of temporal perception. There are similar overreporting and underreporting problems in mobile communication measurement (see Kobayashi & Boase, 2012). Specifically, heavy mobile users believe that they spend less time, or they do indeed spend less time, on social media (see Abeele, Boullens, & Roe, 2013).

A central goal of this research was to substantiate a novel measure of *mobile* use, particularly for social platforms that span multiple devices. As such, we advance the idea that researchers should not only measure general Facebook use (or other social networking sites or social media platforms at large), but also account for the unique variance associated with more and less mobile activities. Indeed, mobile frequency by itself (vs. channel comparisons) should be avoided in inferential analysis, because it will be highly conflated with overall platform use. In contrast, our difference and ratio score measures are conservative and robust in the sense that they conceptually represent the “*mobile-ness*” of Facebook use. Future researchers have the opportunity to measure mobility in multiple ways, as demonstrated and then echoed in this research. Alternatively, when researchers encounter space limitations, our single-item measure directly asking *level of mobile use* represents another valid and efficient option.

From a broader view, our approach calls for researchers to consider contextual dimensions in the conceptualization and measurement of hypothesized *mobile* effects (Bayer et al., in press; Humphreys et al., 2013; Kuru & Pasek, 2016). It is important to note that the proposed measures here are not all-encompassing; they help refine the measurement

of social media use, and should not be used as a single measure of any platform. This realization is vital because social media use is complex, and much depends on which practices are performed, which devices are used, and which contexts are surrounding the user (e.g., “second-screening” in Vaccari, Chadwick, & O’Loughlin, 2015; “home vs. away” in Bayer et al., in press).

Finally, there are a couple of limitations in interpreting our findings. First, we focused on Facebook given its established stature and prevalence in both mobile and nonmobile contexts. But Facebook is one platform in an increasingly complicated media ecosystem. As such, we must be careful in extrapolating these findings to other social networking sites and social media at large. Another limitation is that we treated mobile social media use as an outcome variable, so future research is needed to clarify its predictive strength. Future research could also combine self-report measures with behavioral data scraped from volunteers’ accounts, which would serve as important validation and quantification of the measure. Future research must also examine whether the role of motivational and cognitive processes shifts as mobile platforms become increasingly dominant. Last, we should be careful in comparing the current findings to different countries, which may have different demographic compositions and penetration rates (see Baron & Hard af Segerstad, 2010; Campbell, 2007).

The significance of mobile affordances is explicitly or implicitly assumed in many contemporary theories and studies of social media effects. On its own, this study is an attempt at conceptualizing and measuring the *mobileness* of Facebook users through multiple analytical lenses. More generally, however, our aim is to clarify the underlying dynamics; that is, what makes the mobile side of mobile social media all that different. Indeed, social platforms are increasingly “mobile” by the day, yet mobility itself is rarely disentangled from confounding factors in self-report research. Responding to this concern, we provide scaffolding for survey researchers hoping to explicate true mobile effects.

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Notes

1. It is important to distinguish between social network sites and social media at large. In this vein, our focus on Facebook is limiting as it is only one, although the most prevalent, social

- network site and it also constitutes a social media platform (boyd & Ellison, 2007; Ellison & boyd, 2013).
2. Some of these features are mobile-specific and only meaningful in the mobile context (such as locatability), whereas other features exist in other platforms too (such as multimediality). However, mobile platforms could facilitate these features in different aspects; for example, synchronous video sharing during an event is a very different multimedia experience than post hoc posting and sharing about an event.
 3. Also see Chan (2013), where ways of mobile phone use—communicative (such as accessing social media) versus noncommunicative ways (such as playing games)—are examined.
 4. Several aforementioned empirical studies already examined mobile phone use and social media use simultaneously (e.g., K. G. Park, Han, & Kaid, 2012; Quinn & Oldmeadow, 2013). However, these studies did not focus on mobile social media use as a distinctive phenomenon on its own. Whereas Quinn and Oldmeadow (2013) included a mobile use dummy (whether or not participants accessed SNS via a mobile device), K. G. Park et al. (2012) measured intensity of smartphone use which is adopted from Ellison et al.'s (2007) Facebook Intensity Scale (FBI) where they measured general smartphone use.
 5. See Lai and Yang (2014) for a study on motivations for using Facebook features.
 6. Also see Quan-Haase and Young (2010).
 7. Whereas habit and immersion constructs are about behaviors (i.e., a habit of smoking or immersion in binge-watching), researchers have also pointed out that we can think of them as fundamentally mental/cognitive constructs as well (Verplanken, 2006), and this may especially be true for immersion. In this social media context, we treat them as patterns of use (whether Facebook use is habitual or immersive). We also designed our habit and immersion questions with time-based response options for the frequency (*never to always*) of a set of statements (i.e., “I start using Facebook before I realize I’m doing it”) that directly tap behaviors. In the current study, we focus on habit and immersion in terms of a *pattern of use*—answering the question “*how* respondents use Facebook,” which is independent of whether that constitutes a behavioral or cognitive phenomenon.
 8. It is worth noting that virtual games and augmented reality technologies (e.g., *Pokémon Go*) have the potential to amplify the immersive dimension of mobile use by directly linking the interface to the user’s offline spatial environment. See also research by Liao and Humphreys (2014).
 9. It is important to note that these relations are not causal but could be endogenously related. Given our focus on the measurement and prediction of mobile Facebook use as an outcome variable, the current study treats habit and immersion as *predictors* of mobile Facebook use.
 10. The participant pool enabled students to opt out from research participation in exchange for completing an equivalent homework activity, so the research participation was voluntary.
 11. Among the 524 Qualtrics Facebook users, 196 stated they accessed or used Facebook from their phones. In contrast, all students were Facebook users and almost all had smartphones and used them to access Facebook. See online Appendix A for further details.
 12. A prototypical respondent is a person in the sample who has the mean values for the variables included in the binary logistic regression; for the mean values, go to online Appendices A and B.
 13. It is possible that ownership of a smartphone could be a confounding variable in these comparisons. Hence, we conducted the binary logit analysis only among smartphone owners as well. Despite the smaller sample size, the substantive results and trends are robust to this additional test as well. Please see online Appendix F for this subsample analysis.
 14. These incongruent means and the larger dispersion of individual cases are partly due to the low number of cases at the extreme ends of the *Level of Mobile Use Scale* (Figure 1). However

it could also be related to extreme response tendencies of the respondents at these extreme ends of the perceptual scale. Given that level of mobile Facebook use is a perceptual question, it should not constitute a problem like the extreme response style bias (Greenleaf, 1992) in attitude measures. Still, we replicated the analyses in which mobile level of Facebook was an outcome variable by dropping these extreme ends of the scales and the results regarding our hypotheses did not change (see online Appendix J).

15. When the respondents at the extreme ends of the level of mobile use were removed, the immersion had significance right at the .05 threshold ($b = .16$, $SE = .08$, $p = .05$). See online Appendix I.
16. As mentioned before, we tested habit and immersion separately to avoid multicollinearity. When tested together, habit lost all its weak and approaching significance levels although immersion results were unchanged. Similarly, when motivations and habit or motivations and immersion are tested simultaneously, habit lost its significance, but immersion effects persisted. Hence, immersion seems to have a more robust effect.

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