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**Motivations and Passions in m-Facebook Use**

## 1. Introduction

It is estimated that more than 2.5 billion people globally use social networks (Statista, 2018c), among which Facebook remains by far the largest with nearly 2.3 billion active users (Statista, 2018b), despite the dominance of other social networks in large countries such as China (e.g. WeChat, QQ) and Russia (e.g. Vkontakte). Following a long tradition of technology use models (Davis, 1989; Van der Heijden, 2004), extant literature on social networks focuses on enjoyment (hedonic motivation) and usefulness (utilitarian motivation) as the main perceived benefits motivating people to use social networks such as Facebook (Chang, Hung, Cheng, & Wu, 2015; Cheung, Chiu, & Lee, 2011; Lin & Lu, 2011) Meanwhile, an emergent strand of research draws on the theory of passions (Lemay, Doleck, & Bazelais, 2017; Orosz, Vallerand, Bőthe, Tóth-Király, & Paskuj, 2016; Wakefield & Wakefield, 2016) which posits that user engagement is the result of a psychological process that makes social network use an integral part of the user's own identity (Vallerand et al., 2003; Vallerand et al., 2007).

These apparently divergent approaches create a research gap about how motivations and passions relate to one another and to what extent they explain social network use and Facebook in particular. Therefore, this study seeks to integrate the well-established hedonic and utilitarian motivations with the dualistic theory of passion in order to further illuminate Facebook usage, which may lead to extreme behaviors described as "always online, always connected" (Vorderer, Krömer, & Schneider, 2016).

Facebook has become a primary venue for self-formation (Sauter, 2014) and plays a significant role in identity construction (Nadkarni & Hofmann, 2012). It has emerged as a paradigmatic example of how the extended self takes shape in the digital world, along with the smartphone (Belk, 2013). Moreover, 95% of Facebook's active users access the social network via their smartphone (Statista, 2018a), which has become an integral part of people's lives (Walsh, White, Cox, & Young, 2011, p. 334). Given the intensive mobile use of Facebook, Rodríguez-Ardura and Meseguer-Artola (2018, p. 1) argue that the study of the personal experience of m-Facebookers "is an important issue for theory-driven empirical research". Therefore, in our exploration of the interrelationship between motivations and

passions as antecedents of social network use, which is the focus of this study, we use m-Facebook as our context. In this manner, we follow earlier studies that focus on Facebook mobile users (Kisekka, Bagchi-Sen, & Rao, 2013).

To address the motivational structure of m-Facebook use, we draw on the work of Deci and Ryan (1985) on intrinsic motivation and the rich tradition of the Technology Acceptance Model (TAM) and its extensions (Viswanath Venkatesh, Morris, Davis, & Davis, 2003). TAM has been the starting point for a large proportion of social network studies (e.g. Kwon and Wen (2010), Lallmahomed, Rahim, Ibrahim, and Rahman (2013), Lemay et al. (2017), Lin and Lu (2011)). Unlike the early focus of TAM on organizational information systems where usage is directed toward well-defined corporate objectives mandated via formal lines of authority, the use of personal consumer technologies such as m-Facebook is driven by the need for socialization, which subsequently leads to amusement (Jung, 2014). More recent TAM studies on personal consumer technologies place greater emphasis on hedonic and utilitarian motivations as antecedents of technology usage (Davis, 1989; Van der Heijden, 2004; Viswanath Venkatesh et al., 2003). Similarly, empirical studies in media research, drawing on different streams of literature, consistently demonstrate the significance of enjoyment and usefulness in Facebook use (Alhabash, Chiang, & Huang, 2014; Zhang & Zhou, 2016).

However, TAM has also received criticism for not including significant factors such as "human" process variables  (Legris, Ingham, & Collerette, 2003), raising the need for identifying fundamental psychological processes which mediate the relationship between user motivations and action (Bagozzi, 2007). To address this call, we turn to the dualistic theory of passions which offers an explanatory account of intensive personal engagement with an activity as part of the broader motivational structure of action (Vallerand, Paquet, Philippe, & Charest, 2010). This theory explains the process by which passions emerge and makes the distinction between harmonious and obsessive passion, depending primarily on the extent to which the person exercises volitional control over their engagement or not (Vallerand et al., 2003; Vallerand et al., 2007). The theory of passions, which has been applied in a wide range of activities such as sports or online computer games, appears to be particularly well-suited for examining the intensive engagement of "always online, always connected" m-Facebook users. Empirical studies of the theory of passions to social networks are still few but growing (Lemay et al., 2017; Orosz et al., 2016; Wakefield & Wakefield, 2016).

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Although the theory of passions and the theory of motivations share similar theoretical roots, their empirical relationship remains largely unexplored, leaving a gap between the established literature on motivating technology use and the emerging study of passion for technology. An integrated examination of their effect is required in order to better assess their comparative strengths and their joint ability to explain higher levels of personal technology usage. With the theory of passions remaining relatively underutilised in the personal technology context, this study examines the enabling role of hedonic and utilitarian motivations in the development of harmonious and obsessive passions and their combined effect on m-Facebook use.

This study seeks to answer the following research questions: (1) what is the manner in which hedonic and utilitarian motivations enable the controllable and uncontrollable love of users for m-Facebook as captured by the dualistic theory of passion? (2) what is the comparative performance between an integrative model of motivations and passions with their respective standalone approaches? By examining these questions, this study makes the following contributions. First, it contributes to the theory of social network use, m-Facebook use in particular, by reconciling motivational benefits with passions that give rise to higher levels of usage. Second, it contributes a convergent perspective on the motivations and passions approach as antecedents of social network use and compares their respective effectiveness. It achieves this by developing a relevant model in the context of m-Facebook usage that utilizes both forms of passion (harmonious and obsessive). This is in contrast to other studies on social networks that have missed the insight it brings by not using the full operationalization of the passion construct (Lemay et al., 2017; Wakefield & Wakefield, 2016). Third, it brings insight to practitioners and policy makers who seek a better understanding of the factors leading to higher levels of use and the phenomenon of "always online, always connected".

The paper is organized as follows: first, the theoretical background of the study and the proposed research model is presented, followed by the methodology, results, implications and limitations of this study.

## 2. Theory and research hypotheses

### 2.1 Motivations in the use of technology

The Technology Acceptance Model was originally developed in the context of the perennial problem of resistance to the initial adoption and under-utilization of organizational information systems (Davis, 1989; Davis, Bagozzi, & Warshaw, 1989). For example, a refined understanding of process expectations (e.g. perceived ease of use) has helped advance methods of training that promote the users' internalization of system goals and objectives (Viswanath Venkatesh, 1999). The unified theory of acceptance and use of technology (Viswanath Venkatesh et al., 2003) identifies perceived usefulness, perceived enjoyment, perceived ease of use, and subjective norms among the main factors predicting behavioral intention to use a technology and actual technology use, primarily in organizational contexts.

However, the evidence suggests that the motivational structure of technology use differs before and after adoption. As Nistor (2014) points out, the link between intention and actual use in the standard TAM model encounters empirical difficulties outside the context in which these models were originally developed, namely organizational information systems. In particular, behavioral intention, has been found not to be a significant predictor of actual continuing use (S. S. Kim & Malhotra, 2005). While behavioral intention is the main driver of initial adoption and early use, it wanes in significance over the longer term, as users internalize the use of technology as something learned and familiar (Bhattacherjee, 2001; Bhattacherjee & Barfar, 2011). This insight is of particular relevance to our work on m-Facebook, to the extent that smartphone usage has been widely adopted among 2.3 billion users all over the world and over many years.

Furthermore, subjective norms are significant determinants of initial adoption, for overcoming resistance to initial adoption of organizational information systems, whereas perceived usefulness is a dominant driver in continuing use of the system (Karahanna, Straub, and Chervany (1999)). Finally, the importance of perceived ease of use diminishes with repeated use as users become increasingly proficient (Turel, Serenko, & Giles, 2011). The ubiquity and continuous use of m-Facebook is expected to further diminish the relevance of perceived ease of use. Applications of TAM in the consumer context reveal hedonic and

utilitarian motivations as more prevalent (Van der Heijden, 2004; V. Venkatesh, Thong, & Xu, 2012; Yang, 2010).

The standard treatment of motivations in TAM assumes that perceived usefulness captures extrinsic motivation while hedonic motivation is a measure of intrinsic motivation. Intrinsic motivation is defined as the pursuit of an activity that is inherently interesting or enjoyable, whereas extrinsic motivation is linked to outcomes that are separable from the activity itself (Deci & Ryan, 1985). However, in the context of information technologies, the classification of motivations as intrinsic or extrinsic "does not adequately capture the array of motivations that drive expectations of system use" (Lowry, Gaskin, & Moody, 2015, p. 524). Whereas self-determination theory (SDT) has examined the range of extrinsic motivations from controlled to autonomously regulated (Gagné & Deci, 2005), Lowry et al. (2015) make the distinction between hedonic and other intrinsic motivations: hedonic motivations relate to pleasure and arousal, while other intrinsic motivations relate to accomplishment, learning and socialization. This approach brings much needed clarity to our understanding of utilitarian motivation in the social network context which corresponds to socialization and information sharing (Kwon & Wen, 2010; Lin & Lu, 2011) and is intrinsic by nature (Ryan & Deci, 2000). This is in contrast to the traditional perspective which measures utilitarian motivation as the pursuit of optimization for achievement, efficiency and effectiveness (Babin, Darden, & Griffin, 1994; Holbrook & Hirschman, 1982) which is extrinsic in nature.

The emphasis the literature places on hedonic and utilitarian motivations is exemplified by the fact that when information systems are analysed according to the power of their motivators, they are classified as utilitarian, hedonic and dual-purpose. More specifically, social networks are classified as hedonic (Wu & Lu, 2013) which is also confirmed for Facebook (Lallmahomed et al., 2013).

*2.2 The Dualistic Theory of Passion*

The dualistic model of passion was introduced by Vallerand et al. (2003) who define passion as "a strong inclination toward an activity that people like, that they find important, and in which they invest time and energy" (p. 757), emphasizing the embedding of a particular activity (e.g. sport, hobby or technology use) in a person's identity and

distinguishing it from the generalized passion in a person's character (Vallerand, 2010). Therefore, passion provides the necessary resources to intensely engage with an activity the individual loves (Verner-Filion, Vallerand, Amiot, & Mocanu, 2017), resulting in engagement which involves significance, regularity, and commitment of time and energy (Curran, Hill, Appleton, Vallerand, & Standage, 2015). As Vallerand et al. (2003) aptly illustrate, "those who have a passion for playing the guitar, for reading or jogging do not merely play the guitar, read or jog. They are "guitar players", "readers", or "joggers" (p.757), terms similar to the colloquialisms "facebooker" and "instagrammer" used for those who dedicate a lot of time and energy to Facebook and Instagram respectively.

The dualistic theory of passion makes the distinction between harmonious and obsessive passion, depending primarily on the extent to which the person exercises volitional control over their engagement or not (Vallerand et al., 2003; Vallerand et al., 2007). In the case of harmonious passion, individuals freely exercise their volition in engaging with the activity (Orosz et al., 2016), engendering a sense of personal endorsement and willing participation, without contingencies and without being externally compelled. This activity, despite the great attention and energy it commands, co-exists harmoniously with the other demands on the time of the individual, hence the name harmonious passion. In the case of obsessive passion, the activity controls the person; the person is compelled to yield to either interpersonal pressures (e.g. social acceptance) or intrapersonal pressures (e.g. uncontrollable excitement) in a way that  hijacks great amounts of the person's time and energy, thus conflicting with other commitments in the person's life (Vallerand, 2010). In general, activities that people deliberately and persistently value over time give rise to passion, which may be more or less harmonious and more or less obsessive. Both forms of passion are motivational constructs rather than affective as shown in a recent study of controllable (harmonious) and uncontrollable (obsessive) use of Facebook (Orosz et al., 2016).

During the early stages, the emergence of passion is a function of the value of the activity to the person. Once passion for an activity has been established, "the social and personal factors that are relevant for the internalization process remain involved" (Vallerand, 2010, p. 118). In particular, motivation as perceived value is the fuel underlying activity internalization and the emergence of passion, suggesting that passions and motivations are related, but serve distinct roles (Vallerand, 2010). While passion represents the long-term internalization of the activity as part of the person's identity, motivations correspond to the

short-term value (Koestner & Losier, 2002) derived from particular benefits, and are not conceptualized as part of the person's identity (Deci & Ryan, 1985). The more the activity is valued in terms of specific benefits, the more meaningful it is, and the more inclined the person will be to make it part of their identity (Vallerand, 2010). In other words, while motivations promote direct engagement with an activity in the short term, they also reinforce longer-term passions which, in turn, also exert direct influence thus mediating the effects of motivations on activity engagement.

Whereas motivations and the benefits they represent have been studied extensively, there is less research describing the relationship between these motivations and passions in the context of social network usage. To address this gap and based on the treatment of motivations in the theory of passions, we propose a theoretical model where passions partially mediate m-Facebook usage (See Figure 1).

>>>>>>>>>>>>>>>>>> Figure 1 about here <<<<<<<<<<<<<<<<<<

*2.3 Research hypotheses*

A recent extensive survey of more than 77,000 internet users, finds that the top reasons that motivate social network usage are dominated by its usefulness to socialize and share information (e.g. stay in touch with friends, networking with people) and its entertainment value (e.g. fill up spare time, find funny or entertaining content) (Valentine, 2018). Subrahmanyam, Reich, Waechter, and Espinoza (2008) found that a large proportion of online social networking and messenger activity serves coordination and communication purposes which might be considered utilitarian. At the same time, over half of study participants reported using social networking sites "to fill up free time" and "not be bored", purposes corresponding to hedonic motivation. More recently, among the rapidly growing research on social networks, both hedonic and utilitarian motivations have been found to be significant factors in models of social network acceptance (Doleck, Bazelais, & Lemay, 2017; Lin & Lu, 2015). Similarly, Facebook's usefulness for social connectedness and its entertainment value are repeatedly corroborated by academic explorations of leading social networks (Alhabash & Ma, 2017; Alhabash, Park, Kononova, Chiang, & Wise, 2012). It is also consistent with the recommendation that developers and marketers of new social

networking applications need to focus on the hedonic and utilitarian features of the app in order to maximize their chances of success (Cocosila & Igonor, 2015, p. 366). Therefore, hedonic motivations such as enjoyment and utilitarian motivations such as the usefulness of socialization (Kwon & Wen, 2010), positively influence the use of social networks on mobile phones (Lin & Lu, 2015) and Facebook in particular (Lin & Lu, 2011). Therefore, the following hypotheses are proposed:

**Hypothesis 1:** Higher levels of perceived enjoyment lead to higher levels of m-Facebook usage

**Hypothesis 2:** Higher levels of perceived usefulness lead to higher levels of m-Facebook usage

In the case of Facebook, popular operationalizations of usefulness capture the social network's benefit for socialization due to its ability to facilitate information sharing, interaction and connection with others (Lin & Lu, 2011). In particular, information sharing is a critical factor for Facebook users (Bélanger, Lafreniere, Vallerand, & Kruglanski, 2013). In this sense, usefulness represents the desire for socialization and to be informed, which are classified as intrinsic based on the refined motivation taxonomy offered by Lowry et al. (2015). This perspective on hedonic-motivated systems (Lowry, Gaskin, Twyman, Hammer, & Roberts, 2013) is distinctively different from the case of utilitarian-motivated systems where utility is extrinsic and relates to improving performance and efficiency in the workplace (Davis, Bagozzi, & Warshaw, 1992). As Lowry et al. (2013) explain, the use of hedonic systems such as Facebook is not primarily for the purpose of achieving efficiency or productivity; their usefulness mainly relates to the pursuit of pleasure and enjoyment (Lowry et al., 2015). Indeed, a meta-analysis of hedonic-motivated online games shows that perceived usefulness is a significant and powerful antecedent of perceived enjoyment (Hamari & Keronen, 2017, p. 135). Therefore, we hypothesize that the benefits of information sharing and socialization reinforce the sense of enjoyment:

**Hypothesis 3:** Higher levels of perceived usefulness lead to higher levels of perceived m-Facebook enjoyment

Therefore, on one hand, as a predominantly hedonic-motivated system, m-Facebook's perceived usefulness is expected to facilitate the development of its perceived enjoyment. On

the other, we argue that m-Facebook's perceived usefulness is also complementary to perceived enjoyment in driving Facebook use. In other words, perceived usefulness moderates the relationship between perceived enjoyment and usage as previously demonstrated by Yin, Liu, and Lin (2015). Therefore, we suggest that, given the same level of enjoyment, higher levels of perceived usefulness will magnify the impact of enjoyment on m-Facebook usage. Overall, this is consistent with the moderating role of perceived usefulness in a number of relationships within the information systems literature (Lee & Wu, 2011; Peñarroja, Sánchez, Gamero, Orengo, & Zornoza, 2019; Yoon & Steege, 2013), but more specifically exemplified by the significant joint effect of usefulness and enjoyment in the seminal work of Davis et al. (1992). Therefore, the following hypothesis is proposed:

**Hypothesis 4:** Perceived usefulness moderates the positive relationship between perceived enjoyment and m-Facebook usage, such that the relationship is stronger when perceived usefulness is higher.

Overall, our four hypotheses (H1-H4) describe a moderated mediation; the mediating effect of perceived enjoyment on m-Facebook usage depends on the level of perceived usefulness as a moderator (Hayes, 2015). In our particular case, usefulness facilitates enjoyment, but at the same time, it enhances the influence of enjoyment on usage. Such a model where the antecedent of a mediating variable also moderates its effect on the outcome, is the first type of moderated mediation model presented by Preacher, Rucker, and Hayes (2007).

Hedonic motivation, frequently operationalized as perceived enjoyment, is extensively described as being intrinsic (Gagné & Deci, 2005) and, more recently, the information systems literature has assigned it as a separate category among intrinsic motivations (Lowry et al., 2015). As such, perceived enjoyment is associated with a sense of autonomy which is generally expected to promote harmonious passion (Vallerand, 2010). Having said that, at high levels, enjoyment may also culminate to overindulgence and irresponsible usage demonstrating the so-called paradox of hedonism (Veenhoven, 2003): "the sense of excitement derived from activity engagement [can become] uncontrollable" (Vallerand et al., 2003, p. 757). In other words, hedonic motivation is expected to be associated with both the harmonious and obsessive forms of passion. Therefore, we hypothesize that:

**Hypothesis 5:** Higher levels of perceived m-Facebook enjoyment lead to higher levels of: a) harmonious passion, and b) obsessive passion.

As argued above, users of hedonic systems, in their desire for pleasure, have a particularly intrinsic focus (Lowry et al., 2013) and this is why perceived usefulness in such cases is also intrinsic. In particular, highly cited studies operationalize social network usefulness as the pursuit of socialization (Kwon & Wen, 2010; Lin & Lu, 2011) which is consistent with the embeddedness of relatedness (i.e. being involved with friends) as central element in a construct developed to capture the range of intrinsic motivation (Reeve & Sickenius, 1994). As previously explained, intrinsic motivation is associated with a sense of autonomy and is generally expected to promote harmonious passion (Vallerand, 2010). Since intrinsic motivations drive harmonious passion in a number of different contexts from gambling (Back, Lee, & Stinchfield, 2011) to online gaming (Wang, Liu, Chye, & Chatzisarantis, 2011), we expect the intrinsically motivated perceived usefulness for m-Facebook to promote harmonious passion. Therefore, the following hypothesis is proposed:

**Hypothesis 6:** Higher levels of perceived m-Facebook usefulness lead to higher levels of harmonious passion.

Among the emergent literature on the role of passions in technology, one notable study in the context of Facebook demonstrates the impact of both obsessive and harmonious passions on the persistence of Facebook use (Orosz et al., 2016). While Przybylski, Weinstein, Ryan, and Rigby (2009) find that only obsessive passion drives the amount of play in a wide range of computer games, Puerta-Cortés, Panova, Carbonell, and Chamarro (2017) link both harmonious and obsessive passions with the intensity of play for MMORPG. In an online shopping context, Wang and Yang (2008) find that both obsessive and harmonious passions are linked with more time spent shopping online, but obsessive passion is related to even greater amounts of time than harmonious passion. In a study of Facebook and Twitter engagement, although Wakefield and Wakefield (2016) did not separately consider obsessive and harmonious passion, they find that passion for an activity directly leads to social network use. Overall, according to a meta-analysis of passion research (Curran et al., 2015), both harmonious and obsessive passion are significant drivers of behavior in a broad range of measures, including hours of engagement. Therefore, we propose the following hypotheses:

**Hypothesis 7:** The more harmoniously passionate an individual is about m-Facebook, the higher their levels of m-Facebook usage.

**Hypothesis 8:** The more obsessively passionate an individual is about m-Facebook, the higher their levels of m-Facebook usage.

The integrated research model including our hypotheses is shown in Figure 2.

>>>>>>>>>>>>>>>>>> Figure 2 about here <<<<<<<<<<<<<<<<<<

## 3. Research Methodology

### 3.1 Participants and Data Collection

This study used the Pollfish survey platform that delivers online surveys globally through mobile apps and the mobile web (www.pollfish.com) for its data collection. According to the company, its platform consists of a panel with more than 600M consumers worldwide via its in-app survey delivery partnerships. It has been previously demonstrated to be quite representative of the population (Goel, Obeng, & Rothschild, 2015) and is especially relevant as it allowed us to deliver the survey directly to smartphone users. With 95.1 percent of Facebook active user accounts accessing the social network via smartphones (Statista, 2018a) and since more than 77% of the US population owns a smartphone, delivery of our survey on mobile phones using the Pollfish platform was particularly suitable for examining m-Facebook use.

The Pollfish platform is governed by a strict set of terms and conditions regarding privacy and data protection (https://www.pollfish.com/terms/respondent). Further, this particular research procedure received approval by the research ethics committee of the author's institution. Upon following the survey link, participants were first asked to provide informed consent after having been shown information about the study and the safeguards for anonymity and data protection. No compensation was offered by the researchers and users could opt out at any point of the survey.

The survey was delivered evenly across the day while accounting for the various time zones in the US in order to avoid any time-of-day bias and was completed by 231 US-based Facebook users with 48.1% being female (Table I). While a considerable number of

respondents are between the ages of 18-34 (46.6%), this is consistent with the higher penetration of social networking apps at younger ages (Smith & Anderson, 2018).

>>>>>>>>>>>>>>>>>>> Table I about here <<<<<<<<<<<<<<<<<<<

*3.2 Measures*

The scales used were adapted from previous studies, but pretesting allowed us to further refine the questionnaire (Table II). More specifically, the questionnaire was reviewed by three scholars in the field in order to improve content validity and then pre-tested with 100 respondents prior to the main study. This allowed for minor questionnaire refinements and ensured that all scaling and measurement units were usable; a process that proved to be critical as surveys on mobile phones typically allow a limited number of questions.

All measures of motivations and passions were measured on a 5-point Likert scale and had anchors ranging from "strongly disagree" to "strongly agree". The examination of passions with regards to smartphone use is critical for this study and adapted the scale developed by Vallerand et al. (2003) in order to assess harmonious passion for m-Facebook (e.g. "Using Facebook on my smartphone is for me a passion that I still manage to control ") and obsessive passion (e.g. "I have difficulty imagining my life without using Facebook on my smartphone"). Following previous Facebook research, this study used highly cited scales (Kwon & Wen, 2010; Lin & Lu, 2011) for assessing perceived usefulness expressing the utilitarian motivation of the individual (e.g. "Using Facebook on my smartphone improves my efficiency in sharing information and connecting with others"). Similarly, the hedonic motivation captured by perceived enjoyment (e.g. "Using Facebook on my smartphone is enjoyable ") has also been included in technology acceptance models (Van der Heijden, 2004) and is rooted in consumer research (Babin et al., 1994).

Facebook usage behavior was measured in terms of frequency and intensity of use, based on the scales by Wu and Holsapple (2014) and Viswanath Venkatesh, Brown, Maruping, and Bala (2008) and its items used a 7-point Likert scales. The choice to use self-reported measures for Facebook use is well justified based on their strong positive correlation with actual time spent on Facebook (Junco, 2013). The scales for each item are shown Table II

and the values selected were calibrated in the pretest conducted. The average level of m-Facebook use on our scale is 4.288 with a standard deviation of 1.25 (Table III). This indicates the presence of a broad range of user affinity towards m-Facebook, with our average user describing themselves as a moderate user (Table II). Gender and age were used as control variables since a number of studies have reported gender and age effects in the use of social networks and mobile phone (Y. Kim, Briley, & Ocepek, 2015).

## 4. Analysis and results

### 4.1 Measurement model evaluation

In order to test the proposed hypotheses, data were analyzed using partial least squares and more specifically SmartPLS (Ringle, Wende, & Will, 2005) since it can more easily integrate moderating effects such as the one hypothesised. Kock and Hadaya (2018) suggest that based on the inverse square root method, a reasonable minimum sample size for PLS is 160 when one does not know in advance the value of the path coefficients. Given our sample size of 231, we exceed this recommendation.

All item loadings were reviewed to be significant at the .01 level, the average variance extracted (AVE) values were higher than 0.5, and composite reliabilities (CR) were higher than 0.7 (Table II) indicating acceptable reliability and convergent validity (Fornell & Larcker, 1981). Given that the AVE and CR exceed recommended thresholds, there were no low-loading items to remove (Hair Jr, Hult, Ringle, & Sarstedt, 2016). Further, discriminant validity was demonstrated since all heterotrait-monotrait (HTMT) values are below the 0.85 threshold and the square roots of AVE were greater than the corresponding row and column values (Table III). This was further confirmed by performing a confirmatory factor analysis that did yield an excellent fit ($\chi^2$/df =194.9/125=1.56, CFI=0.96, TLI=0.96 and RMSEA=0.049).

Since information was collected by the same-source and was self-reported data, common method variance tests were conducted (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Application of the Harman's single-factor test indicated that common method variance is not a problem in this study; based on a principal components analysis no single construct accounted for a majority of the total variance. In addition, the correlations between constructs (Table III) are clearly lower than 0.90 providing additional support that this study does not

suffer from common method variance bias problems (Pavlou, Liang, & Xue, 2007). Multicollinearity was also examined using the variance inflation factor (VIF). The highest VIF value was 2.54 which is below commonly acceptable thresholds of 3.3 and provides additional support that this study does not suffer from common method variance (Kock, 2015).

>>>>>>>>>>>>>>>>>> Table II about here <<<<<<<<<<<<<<<<<<<

>>>>>>>>>>>>>>>>>> Table III about here <<<<<<<<<<<<<<<<<<<

*4.2 Structural Model evaluation and hypothesis testing*

The PLS procedure produced very good fit statistics of the hypothesized model including age and gender as controls: SRMR=0.066 (Hu & Bentler, 1999) which was also followed by a bootstrapping procedure with 500 samples. The paths of the model (Table IV) demonstrated that all hypotheses hold with exception of H2: perceived usefulness is not directly linked to m-Facebook usage. Nonetheless, perceived usefulness was found to be a significant motivational driver of perceived enjoyment (H3) and harmonious passion (H5)[1], and at the same time enhances the effectiveness of perceived enjoyment on usage (H4). Perceived enjoyment was found to directly drive m-Facebook usage and motivate both harmonious and obsessive passions (H5), providing further support to the paradoxical nature of hedonism that may lead to both autonomous and externally controlled behaviors (Veenhoven, 2003). Further, both passions were found to fuel Facebook usage (H8).

>>>>>>>>>>>>>>>>>> Table IV about here <<<<<<<<<<<<<<<<<<<

We further tested our hypothesized moderated mediation based on the procedure described by Hayes (2015). In particular, using SmartPLS and bootstrapping with 10,000 subsamples, we first find that in the absence of perceived enjoyment, the direct effect of perceived usefulness on usage is significant ($\beta$=0.31 CI: {0.19, 0.42}, t=5.24). When perceived enjoyment is added as our mediator, the direct effect of perceived usefulness on

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[1] As an additional test of our hypotheses that m-Facebook perceived usefulness is intrinsic and only drives harmonious passion and not obsessive passion, we tested an alternative model which included a link between perceived usefulness and obsessive passion. This link was not significant confirming our theorization and hypotheses.

usage becomes insignificant (β=0.11 CI: {-0.04, 0.26}, t=1.44), but its indirect effect through perceived enjoyment is significant (β=0.28 CI: {0.19, 0.38}, t=5.39). The direct effect of perceived usefulness on perceived enjoyment in our mediated model is also significant (β=0.54 CI: {0.43, 0.64}, t=9.74). Further, both the direct effect of perceived enjoyment on usage (β=0.52 CI: {0.39, 0.65}, t=7.82) and its moderated effect with perceived usefulness (β=0.13 CI: {0.02, 0.21}, t=2.83) are significant confirming the hypothesized moderated mediation.

Overall, our unsupported hypothesis (H2), the absence of a direct effect between perceived usefulness and usage, is in line with a number of studies that find the link between perceived usefulness and Facebook usage to be insignificant (Lallmahomed et al., 2013) consistent with studies in other hedonic personal technologies such as online games and MMORPG (Hsu & Lu, 2004; Wu & Holsapple, 2014). Further, although socializing is identified as the most important motivation for Facebook, only its entertainment value is significant in predicting usage (Alhabash et al., 2012). It also relates to previous research which finds that hedonic value "most significantly influenced [social network] usage" (Lin & Lu, 2015, p. 120), is a stronger predictor of intention and actual use of online social networks (Sledgianowski & Kulviwat, 2009), and has dominant impact in the context of mobile social apps (Hsiao, Chang, & Tang, 2016). Overall, our findings confirm previous literature that presents social networking as a hedonic system. Finally, the control variables employed, gender and age, indicate that women demonstrate higher levels of perceived enjoyment, obsessive passion and usage; younger users demonstrate higher levels of usage.

Further, we examine the f-squared values for the antecedents of usage (Table IV); only obsessive passion demonstrates a medium effect (0.35>f-squared>0.15) and is responsible for about half of the variance explained. The remaining effects are certainly significant, but considered weak (0.15>f-squared>0.02). As a result, we find obsessive passion to be the best single predictor of m-Facebook usage. In a "motivations only" model, when passions are absent, the effect of perceived enjoyment on usage increases to moderate indicating the mediating role of passions. Finally, based on a bootstrapping procedure with 10,000 subsamples we find that in our integrated model the specific indirect effects of both perceived enjoyment (PE → HP → US, β=0.08 CI: {0.03, 0.15}, t=2.48; PE → OP → US, β=0.18 CI: {0.12, 0.24}, t=5.62) and perceived usefulness (PU → HP → US, β=0.07 CI: {0.02, 0.14},

t=2.32; PU $\rightarrow$ PE$\rightarrow$ HP $\rightarrow$ US, $\beta$=0.04 CI: {0.01, 0.08}, t=2.35; PU $\rightarrow$ PE$\rightarrow$ OP $\rightarrow$ US, $\beta$=0.10 CI: {0.06, 0.14}, t=4.75) on usage through passions are significant. This indicates their importance in motivating passions and ultimately usage.

We also examine and compare alternative models in order to assess the importance of integrating passions and motivations in a single model for predicting m-Facebook usage. More specifically, we use the Bayesian Information Criterion (BIC) which assesses the overall fit of a model and allows the comparison of both nested and non-nested models. In particular, we find that our integrated research model (Figure 2) is significantly better in explaining m-Facebook usage than models using only passions or only motivations (Table V). Based on the criteria set by Raftery (1995), the BIC difference between our full model and the "passions only" model is strong (difference in the range of 6-8) and the BIC difference between our "passions only" and the "motivations only" model is very strong (difference > 10). Given the significance of obsessive passion as an antecedent of usage, we also examined a model with only this variable. The resulting "OP only" model demonstrates very good explanatory power, making it significantly stronger than our "motivations only" model, but our "passions only" model remained significantly stronger which indicates the additional contribution of harmonious passion.

>>>>>>>>>>>>>>>>>> Table V about here <<<<<<<<<<<<<<<<<<<

## 5. Discussion and implications

By integrating the theory of passions with the theory of motivations for social media use, this paper makes three main contributions, of which two relate to theory development and the third to managerial practice.

*5.1 Contribution to theory*

First, the findings of this study contribute to the theory of social network use, m-Facebook in particular, by reconciling motivational benefits with passions that give rise to higher levels of usage. More specifically, we demonstrate the significant role of harmonious and obsessive passion and their relationship with the longstanding tradition of utilitarian and hedonic motivations. Our analysis shows that while perceived enjoyment has a pivotal role in terms of fuelling passions (H5a, H5b), and directly driving usage (H1), perceived usefulness is

substantial in its own way. Even though perceived usefulness, operationalized as socialization and the acquisition and sharing of information (Kwon & Wen, 2010; Lin & Lu, 2011) does not seem to have a significant direct influence on m-Facebook usage (H2 is rejected), it is (1) an antecedent of perceived enjoyment (H3), supporting the notion that utility contributes to enjoyment (Hamari & Keronen, 2017; Lowry et al., 2013); (2) a moderator of the effect of enjoyment on usage (H4), indicating that perceived usefulness is complementary to the distinctive value of enjoyment (Yin et al., 2015); and (3) an antecedent of harmonious passion (H6), indicating that, despite its indirect effect on obsessive passion (via enjoyment - H3, H5b),.

These findings lend additional support to the small number of studies that also raise the importance of utilitarian motivation for social networks (Salehan, Kim, & Kim, 2017; Xu, Ryan, Prybutok, & Wen, 2012). Further, our results support prior literature indicating that intrinsic motives of learning and socialization (Lowry et al., 2015) only promote harmonious and not obsessive passion (Vallerand, 2010). They also demonstrate that perceived enjoyment strongly fuels obsessive passion (H5b). This is consistent with research arguing about the paradox of hedonic motivation: whereas in moderation enjoyment promotes sociability, rational control and general well-being, too much of it may lead to self-indulgence, which, in turn, reduces critical thinking and may give rise to compulsive behaviour (Turel & Serenko, 2012; Vallerand et al., 2003; Veenhoven, 2003). According to the theory of passions, while both passions are integrated in the self, obsessive passion tends to take greater space in the person's identity than harmonious passion (Vallerand et al., 2003). Indeed, our results suggest that (H8).

This study also highlights the strong effects of our control variables, which are likely to have implications for further research. In particular, women and younger individuals tend to display greater levels of m-Facebook use. Further, women demonstrate higher levels of hedonic motivation than men. These findings are consistent with previous studies showing that demographics (e.g. age, gender) are significant predictors of smartphone app use (Y. Kim et al., 2015). In addition, studies have shown that women tend to use social networks for relational purposes, such as maintaining close ties, while men tend use them in order to gain access to general information (Krasnova, Veltri, Eling, & Buxmann, 2017).

Second, by linking motivations to passions, this paper contributes a convergent perspective on the motivations and passions as antecedents of social network use and compares their respective effectiveness. Notably, even though our results show that hedonic and utilitarian motivations are significant and substantial antecedents of m-Facebook usage, the theory of passions carries significantly stronger explanatory power (Table V). Furthermore, our analysis shows that passions partially mediate motivations. Notwithstanding the powerful and direct role of hedonic motivation, usefulness and enjoyment represent the initial perceived value of m-Facebook to its users, who, over time, make m-Facebook part of their identity in harmonious and obsessive ways; passions reflect a long-term internalization of m-Facebook in the user's identity. Nonetheless, obsessive passion is the single most important antecedent in driving m-Facebook use indicating that such a use is uncontrollable in nature.

*5.2 Implications for practice*

Third, our study contributes clear insight for practitioners and policy makers who seek a better understanding of the factors leading to high levels of m-Facebook usage, and the phenomenon of "always online, always connected". This suggests that app developers and service designers need to become acutely aware of the significance and role of passions in maintaining actively engaged app users. However, obsessive passion signifies an uncontrollable engagement with the app which is typically at the expense of other activities in the user's life. Therefore, by achieving a heighten level of enjoyment for their apps, developers increase the levels of obsessive passion. Developers should, as a countervailing force, also invest in promoting usefulness, which can support more adaptive, volitional and controllable user engagement via harmonious passion.

Besides the significant and obvious moral responsibility implications of inducing excessive repeat usage, obsessive passion has negative consequences for the app or service itself. According to the theory of passions, while the user is uncontrollably engaged with the app, he or she may not fully focus on the task at hand, may not experience as much positive affect, may suffer emotionally, and may ruminate and experience lower self-esteem (Vallerand et al., 2010). Such effects could reflect negatively on the app and its developers. The results of this study indicate that developers have the option to aim at cultivating

preferably harmonious, rather than obsessive, user engagement as a vehicle for achieving their business targets.

*5.3. Limitations*

Notwithstanding the contributions of this paper, the theoretical and empirical scope of the research design imposes certain limitations and creates specific opportunities for promising future research.

One constraint of this study arises from the method of data collection, which limits the number of constructs that can be included in a model. Specifically, the questionnaire was distributed in-app, on the smartphone interface. Following the recommendations of mobile application designers and given the well-known short attention span during smartphone use, this study was forced to be highly selective with the number of variables in the research model. Having said that, this method yields high quality data efficiently. Researchers who wish to follow such an approach should be prepared to hypothesize models that are more parsimonious than those they may be used to. Further, although common method variance was examined, data were self-reported by a single respondent. Future research could try to utilize a different data collection methodology and possibly collect longitudinal data, something that was not feasible for this study since a strict ethical policy was applied where the individual user was not identifiable and therefore could not be retargeted.

The data collection approach imposed demographic (gender and age), geographical (across the time zones of the US) and time-of-day stratification (thus precluding job and lifestyle bias) for the sample. However, because the questionnaire was administered through third party apps, one might question whether the sample contains a disproportionate number of (i) people who use particular apps carrying the survey, and/or (ii) users who are more experienced and confident in handling disruptions to their normal flow of app interaction. However, the respondent age profile is consistent with reports on the demographics of US smartphone users (PewResearchCenter, 2017) and probing mobile users about how they use Facebook on their smartphone while they are actually using their smartphone, is a strength of this study. Moreover, this approach appears to have advantages over other popular methods of crowdsourcing data collection, which are increasingly being adopted by researchers (Goodman & Paolacci, 2017).

This study targeted Facebook users in the US; therefore, by not examining users in other countries or users of other social media platforms, it has a distinct social-cultural bias which limits the generalizability of the results beyond this particular context. Further, this study does not have sufficient background data to explore the broader profile of respondents, such as their use of multiple social media platforms, the breadth and depth of their engagement and sentiment towards other social media apps, or their personality traits[2].

Finally, while Facebook is predominately accessed via smartphones (Statista, 2018a), it is reasonable to question whether the platform (e.g. desktop, tablet, smartphone) makes a difference to how Facebook is used and experienced (Jones, Ferreira, Hosio, Goncalves, & Kostakos, 2015). In particular, it is well-documented that the smartphone itself is prone to habitual and potentially addictive use (Soror, Hammer, Steelman, Davis, & Limayem, 2015); therefore, future research should ask whether it is the platform (smartphone vs. desktop) or the service (Facebook) that induces excessive usage, or both.

*5.4 Future research*

Future studies of personal immersive technologies such as social networks or the smartphone should pay closer attention to the psychological mechanisms captured by the theory of passions. Having established the significance and role of passions in the motivational structure of m-Facebook usage, future research should, first, examine the behavioral and other consequences on the user. What is the interplay between harmonious and obsessive passion on one hand, and the impact of social network usage on task performance, cognitive processes, general wellbeing, habit, or addictive behaviors on the other? These are central questions in the theory of passions (Bridekirk, Turcotte, & Oddson, 2016; Carpentier, Mageau, & Vallerand, 2012), of emerging importance in technology studies (Seguin-Levesque et al., 2003), and of fast-growing interest in the public sphere. Another stream of research on social networks considers the role of habit (Soror et al., 2015) and self-control or regulation (Turel & Qahri-Saremi, 2016) in excessive and problematic use. Extending this research to examine the interplay with passions is expected to yield further contribution to our understanding of the psychological processes involved in Facebook use. Even though the focus of this study is the interplay between motivations and

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[2] We are grateful to an anonymous reviewer for pointing this out.

passions, there is a further opportunity to examine these factors in conjunction with the personality of the user. Future research with experimental (e.g., Bélanger et al. (2013)), longitudinal or prospective (e.g., Lavigne, Forest, and Crevier-Braud (2012);Carbonneau, Vallerand, Fernet, and Guay (2008)) research designs would be suitable for these questions and would address some of the issues of cross-sectional studies (Maxwell & Cole, 2007).

This study reveals the significance of perceived enjoyment and perceived usefulness as motivational forces in m-Facebook usage. Future research should explore whether there are empirically observable thresholds of optimal enjoyment or utility, beyond which m-Facebook engagement becomes deleterious. Further, it is worth exploring which other elements of user experience contribute to perceived enjoyment and whether some of them reinforce harmonious (as perceived usefulness does in this study) or obsessive passion. Similarly, future research should consider the role of extrinsic motivation in the development of passions, such as fear of missing out (Beyens, Frison, & Eggermont, 2016; Przybylski, Murayama, DeHaan, & Gladwell, 2013). Further work on gender- and age-specific expectations from social networking apps is also warranted.

Beyond m-Facebook, further research should seek to clarify the motivational profile of different technology services in terms of the interplay between hedonic and utilitarian motivation, between harmonious and obsessive passion, and between motivations and passions. For example, do other social networks, or games, or other hedonic smartphone applications demonstrate the same properties and role for utilitarian motivation? More broadly, this is an era during which digital technologies are increasingly more personal, more intimate, more closely integrated with their users: social networks, smartphones, smart watches, fitness trackers, home assistants and many other tools reach deep into the motivational forces that drive each person's behavior. As many commentators point out, the potential consequences are unprecedented and poorly understood (Harari, 2018). Research on the integration of technology and user identity is needed now more than ever before.

*5.5 Concluding remarks*

This paper contributes to the literature on social networks and m-Facebook use in particular, by developing a theoretical model that elaborates the joint role of passions and motivations in promoting usage. We show that harmonious and obsessive passions are driven by utilitarian

and hedonic motivations. The significant explanatory power of passions for determining m-Facebook usage opens up novel insights as it allows us to identify the controllable and uncontrollable love for the activity. More specifically, we demonstrate that the process of internalizing m-Facebook use into the user's identity in the form of passions, emerges as a consequence of the strength of perceived usefulness and perceived enjoyment (Vallerand, 2010). Accordingly, the more one values their use of m-Facebook (i.e. the stronger the hedonic and utilitarian motivations), the greater the passions for m-Facebook and the more it is being used. Our findings have significant implications for future research since passions are a demonstrably better predictor than motivations.

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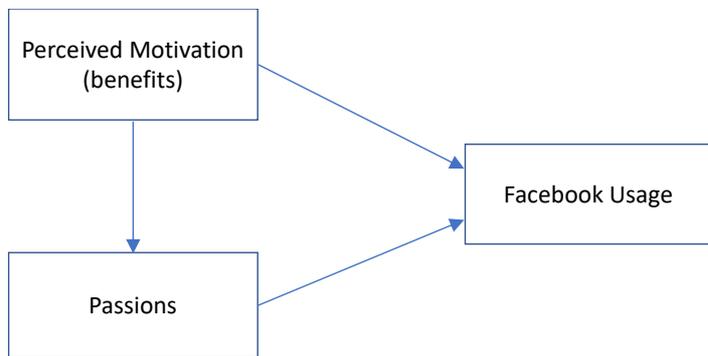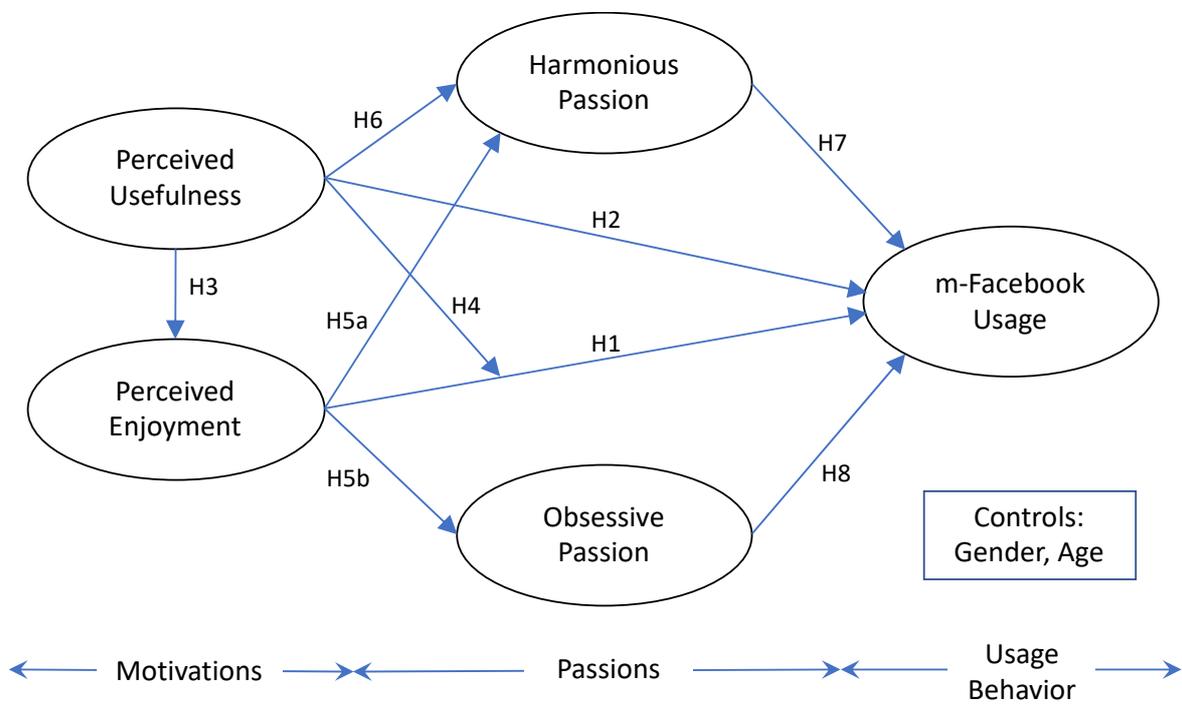
Figure 1. Conceptual model



Figure 2. Motivations and passions integrated research model

| Measure | | N | % |
|---|---|---|---|
| Gender | Male | 111 | 48.1 |
| | Female | 120 | 51.9 |
| | | | |
| Age | 18 - 24 | 31 | 14.9 |
| | 25 - 34 | 75 | 31.7 |
| | 35 - 44 | 63 | 30.3 |
| | 45 - 54 | 38 | 13.6 |
| | > 54 | 24 | 9.5 |

**Table I.** Demographics of study participants

| Construct | Adapted questionnaire items | Loadings | CR | AVE |
|---|---|---|---|---|
| Harmonious Passion | HP1: Using Facebook on my smartphone allows me to live a variety of experiences | 0.798 | 0.875 | 0.638 |
| | HP2: The new things that I discover with Facebook on my smartphone allow me to appreciate it even more | 0.848 | | |
| | HP3: Using Facebook on my smartphone is for me a passion that I still manage to control | 0.741 | | |
| | HP4: Using Facebook on my smartphone allows me to live memorable experiences | 0.804 | | |
| Obsessive Passion | OP1: The urge is so strong. I can't help myself from using Facebook on my smartphone | 0.777 | 0.887 | 0.664 |
| | OP2: I have difficulty imagining my life without using Facebook on my smartphone | 0.835 | | |
| | OP3: I almost have an obsessive feeling for using Facebook on my smartphone | 0.861 | | |
| | OP4: I am emotionally dependent on using Facebook on my smartphone | 0.778 | | |
| Perceived Usefulness | PU1: Using Facebook on my smartphone enables me to acquire more information or know more people | 0.775 | 0.875 | 0.701 |
| | PU2: Using Facebook on my smartphone improves my efficiency in sharing information and connecting with others | 0.884 | | |
| | PU3: Using Facebook on my smartphone is useful for interacting with other members | 0.849 | | |
| Perceived Enjoyment | PE1: Using Facebook on my smartphone is very entertaining | 0.842 | 0.906 | 0.764 |
| | PE2: Using Facebook on my smartphone is enjoyable | 0.897 | | |
| | PE3: Using Facebook on my smartphone is fun | 0.881 | | |
| m-Facebook Usage | US1: Please estimate how long you spend on average per day on Facebook using your smartphone (7 point scale: Don't use at all, Less than 10 minutes, About 20 minutes, About 40 minutes, About 1 hour, About 1.5 hours, More than 1.5 hours) | 0.821 | 0.894 | 0.679 |
| | US2: Please estimate how many times per day on average you access Facebook on your smartphone (7 point scale: Don't use at all, Less than once per day, 1-2 times per day, 3-5 times per day, 6-10 times per day, 11-15 times per day, More than 15 times per day) | 0.845 | | |
| | US3: Please estimate how often you post on Facebook using your smartphone (7 point scale: Don't post at all, Less than once per week, About once a week, Several times a week, About once a day, About twice a day, More than two times a day) | 0.776 | | |
| | US4: How do you consider the extent of your current Facebook use on your smartphone? (7 point scale: Non use, Very light use, Light use, Moderate use, Somewhat heavy use, Heavy use, Very heavy use) | 0.851 | | |

**Table II.** Questionnaire measurement scales and internal reliability of the constructs

| Construct | Mean | SD | 1 | 2 | 3 | 4 | 5 |
|-----------|------|-----|------|------|------|------|------|
| 1. HP | 3.735 | 0.824 | *0.799* | | | | |
| 2. OP | 2.655 | 0.971 | 0.346 | *0.815* | | | |
| 3. PU | 4.035 | 0.750 | 0.586 | 0.314 | *0.836* | | |
| 4. PE | 4.031 | 0.713 | 0.608 | 0.497 | 0.542 | *0.874* | |
| 5. US | 4.288 | 1.250 | 0.431 | 0.568 | 0.320 | 0.517 | *0.824* |

**Note:** Square roots of the AVE are reported in italics on the diagonal; HP: Harmonious Passion, OP: Obsessive Passion; PU: Perceived usefulness, PE: Perceived Enjoyment; US: m-Facebook Use

**Table III.** Measure summary statistics and correlations

| Hypothesis | Path | Std β | SE | t-value | Decision | $f^2$ | $R^2$ adjusted | $Q^2$ |
|------------|------|-------|-----|---------|----------|-------|----------------|-------|
| H1 | PE → US | 0.26** | 0.066 | 4.04 | Supported | 0.064 | 0.47 | 0.293 |
| H2 | PU → US | 0.01 | 0.071 | 0.16 | Not Supported | 0.000 | | |
| H3 | PU → PE | 0.54** | 0.054 | 9.80 | Supported | 0.411 | 0.30 | 0.216 |
| H4 | PU x PE → US | 0.12** | 0.042 | 3.04 | Supported | 0.057 | | |
| H5a | PE → HP | 0.41** | 0.072 | 5.75 | Supported | 0.217 | | |
| H5b | PE → OP | 0.48** | 0.051 | 9.39 | Supported | 0.300 | 0.25 | 0.158 |
| H6 | PU → HP | 0.37** | 0.066 | 5.56 | Supported | 0.174 | 0.45 | 0.276 |
| H7 | HP → US | 0.19** | 0.067 | 2.83 | Supported | 0.036 | | |
| H8 | OP → US | 0.37** | 0.053 | 6.45 | Supported | 0.185 | | |

**Note:** **p<0.01, *p<0.05; Age and Gender used as controls

**Table IV.** Results of structural model analysis

| | m-Facebook usage | |
|-------|-----------|------|
| Model | R-squared | BIC |
| Integrated | 0.47 | -117.5 |
| Passions only | 0.41 | -100.1 |
| OP only | 0.36 | -82.7 |
| Motivations only | 0.32 | -68.8 |

**Note:** Smaller BIC indicates better model. BIC absolute difference: >10=very strong, 6-8=strong

**Table V.** Model comparisons