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Motivational, emotional, and behavioral correlates of fear of missing out

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ABSTRACT

Social media utilities have made it easier than ever to know about the range of online or offline social activities one could be engaging. On the upside, these social resources provide a multitude of opportunities for interaction; on the downside, they often broadcast more options than can be pursued, given practical restrictions and limited time. This dual nature of social media has driven popular interest in the concept of *Fear of Missing Out* – popularly referred to as FoMO. Defined as a pervasive apprehension that others might be having rewarding experiences from which one is absent, FoMO is characterized by the desire to stay continually connected with what others are doing. The present research presents three studies conducted to advance an empirically based understanding of the fear of missing out phenomenon. The first study collected a diverse international sample of participants in order to create a robust individual differences measure of FoMO, the *Fear of Missing Out scale* (FoMOs); this study is the first to operationalize the construct. Study 2 recruited a nationally representative cohort to investigate how demographic, motivational and well-being factors relate to FoMO. Study 3 examined the behavioral and emotional correlates of fear of missing out in a sample of young adults. Implications of the FoMOs measure and for the future study of FoMO are discussed.

1. Introduction

Social media utilities provide increasingly abundant forms of social information. These mediums afford easy access to real-time information about the activities, events, and conversations happening across diverse social networks. This digitally fueled deluge of updates has kindled interest in and writing about a relatively new phenomenon termed *Fear of Missing Out*, popularly referred to as FoMO. Defined as a pervasive apprehension that others might be having rewarding experiences from which one is absent, FoMO is characterized by the desire to stay continually connected with what others are doing.

For those who fear missing out, participation in social media may be especially attractive. Services like Facebook, Twitter, and Foursquare are technological tools for seeking social connection and provide the promise of greater levels of social involvement (Ellison, Steinfield, & Lampe, 2007). In many ways, social media utilities such as these can be thought of as reducing the "cost of admission" for being socially engaged. While these social tools provide advantages for the general population, it is likely they are a particular boon for those who grapple with fear of missing out.

Indeed, social media engagement presents a high efficiency low friction path for those who are oriented towards a continual connection with what is going on. There is good reason then to expect that those who are high in fear of missing out gravitate towards social media. Despite increased interest in and writing about FoMO, it is noteworthy that very little is empirically known about the phenomenon. To address this deficit, the present research applies a motivation-based perspective to delve deeper into fear of missing out and explore its motivational, behavioral, and well-being correlates.

1.1. Psychological needs perspective

Self-determination theory (SDT; Deci & Ryan, 1985) a macro-theory of human motivation provides a useful perspective for framing an empirically based understanding of FoMO. According to SDT effective self-regulation and psychological health are based on the satisfaction of three basic psychological needs: competence – the capacity to effectively act on the world, autonomy – self-authorship or personal initiative, and relatedness – closeness or connectedness with others. Research conducted in the sports (Hagger & Chatzisarantis, 2007), education (Ryan & Deci, 2000), and video-gaming domains (Przybylski, Weinstein, Ryan, & Rigby,

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2009), indicate that basic need satisfaction is robustly associated with proactive behavioral regulation. Through this theoretical lens, the FoMO phenomenon can be understood as self-regulatory limbo arising from situational or chronic deficits in psychological need satisfactions.

Following this line of thought, low levels of basic need satisfaction may relate to FoMO and social media engagement in two ways. The link could be direct, individuals who are low in basic need satisfaction may gravitate towards social media use because it is perceived as a resource to get in touch with others, a tool to develop social competence, and an opportunity to deepen social ties. The relation between basic needs and social media engagement could also be indirect, that is, linked by way of FoMO. Providing that need deficits could lead some towards a general sensitivity to fear of missing out, it is possible that need satisfaction is linked to social media use only insofar as it is linked to FoMO. Said differently, fear of missing out could serve as a mediator linking deficits in psychological needs to social media engagement.

1.2. FoMO and functioning

Another important dimension of FoMO are its potential links with psychological health and well-being. In a recent book, Turkle (2011) advances the position that technology-mediated communication carries positive as well as negative influences. Turkle explores a number of case studies and outlines general conditions under which digital communication mediums can undermine self-reflection and ultimately degrade well-being. She argues the "tethered self" provided by always-on communication technologies can distract us from important social experiences in the here-and-now. Turkle advances the position a strong desire to stay continuously connected is potentially dangerous as it encourages people to check in with their digital technology even when they are operating motor vehicles. In line with this, accounts of FoMO presented by journalists writing for The New York Times (Wortham, 2011) and San Francisco Chronicle (Morford, 2010) highlight how a mix of social media and fear of missing out may be linked to general unhappiness. Wortham (2011) proposes that FoMO may be a source of negative mood or depressed feelings in part because it undermines the sense that one has made the best decisions in life.

Research focused on the motives underlying social media give additional reasons to expect FoMO linked to deficits in mood and satisfaction with life drive social media engagement. Research on internal motives for social media engagement indicates that avoiding negative emotional states such as loneliness (Burke, Marlow, & Lento, 2010) and boredom (Lampe , Ellison, & Steinfield, 2007) compel Facebook use. In a similar vein, dissatisfaction with the present state of one's relationships has been identified as a motive undergirding social media use (Ellison, Steinfield, & Lampe, 2007). These perspectives suggest social media affords an outlet for social and emotional frustrations. Taken together with the wider motivation literature, it appears that fear of missing out could serve an important role in linking individual variability in factors such as psychological need satisfaction, overall mood, and general life satisfaction to social media engagement.

1.3. Previous research

Some preliminary research has explored the prevalence of FoMO and its relation to social media (JWT, 2011, 2012). This survey work defined FoMO as "the uneasy and sometimes all-consuming feeling that you're missing out – that your peers are doing, in the know about, or in possession of more or something better than you". Under this framing of FoMO, nearly three quarters of young adults reported they experienced the phenomenon. This polling also indicated that younger people tended to experienced intense unease when they felt at risk for missing out on positive experience, and that males were more likely than females to turn to social media when struggling with a sense of FoMO. Taken together, findings from this initial examination of fear of missing out suggest it may be quite common among some groups. That said, these preliminary industry reports leave open wider questions about the operationalization, correlates, and overall relevance of FoMO.

1.4. Present research

The aim of the present research was to advance an empirically-based and theoretically-meaningful framing of the fear of missing out phenomenon. To this end, we designed and conducted three studies. In the first, we developed a self-report assessment that measured the FoMO construct as an individual difference. In the second, we explored how fear of missing out constellates with a range of demographic and individual difference factors linked to social media engagement. In the third, we examined its emotional and behavioral correlates.

In Study 1, we collected data from a large and diverse international sample of participants in order to create a robust individual differences measure of FoMO. Guided by extant writing about fear of missing out we drafted a pool of statements reflecting FoMO and used a data driven approach to select representative items with the best psychometric properties. Our aim in this first study was to create a sensitive self-report instrument, one that is informative for individuals with low, medium, and high latent levels of fear of missing out, and one that is useful for measuring FoMO in a wide range of research contexts.

In Study 2, we recruited a nationally representative sample to empirically evaluate fear of missing out from a broad perspective. This study was conducted with two aims in mind. First, we aimed to investigate demographic variability in FoMO, to explore who in the general population tended towards fear of missing out. Our second goal was to evaluate FoMO as a mediating factor linking individual differences identified in past motivation and social media research to behavioral engagement with social media.

In Study 3, we shifted focus from large-scale samples to a university cohort to fine-grained understanding of how FoMO related to emotion and behavior. In particular, our goal for this study was to understand how those high in fear of missing out felt about their social media usage, how frequently they used social media, and the extent to which FoMO enables social media as a distractor from other important responsibilities in everyday life.

2. Study 1: measuring FoMO

Our objective in the first study was to create a robust individual differences measure of fear of missing out. More specifically, we wanted to create a brief, self-report assessment that minimized participant burden and provided maximal information about an individual's level of FoMO. To achieve this goal we paired a theory-guided method with latent trait theory analysis to craft a robust assessment of fear of missing out.

To take full advantage of this approach we needed to start with a large pool of potential FoMO items. Based on a review of popular and industry writing on FoMO (e.g., JWT, 2011; Morford, 2010; Wortham, 2011) we drafted 32 items meant to reflect the fears, worries, and anxieties people may have in relation to being in (or out of) touch with the events, experiences, and conversations happening across their extended social circles. We framed participants' reading of and responses to scale items in terms of what really reflected their general experiences instead of what they thought their experiences should be.

We then recruited a diverse international sample of adults to provide self-report ratings for this broad pool of candidate items, which focused on the extent to which people feared missing out on rewarding experiences, activities, and methods of discourse (e.g. in jokes). The large sample was intended to be representative of a wide range of potential respondents and provided the volume of responses needed to empirically identify a subset of optimally representative items using latent trait theory analysis.

2.1. Method

Participants were 672 men and 341 women (n = 1013), ranging in age from 18 to 62 years (M = 28.5, SD = 8.55). All participants were fluent in English; 41.1% lived in the United States, 35.9% India, 5.6% Australia, 3.9% Canada, 3.2% United Kingdom, and 10.3% resided in other nations (each not exceeding 2%). Participants were recruited online through Amazon's Mechanical Turk worker system; each participant was compensated $0.30 each for completing the questionnaire.

2.1.1. Fear of Missing Out scale (FoMOs)

Participants completed basic demographic questions followed by the 32 candidate items drafted for the FoMOs by way of an HTML questionnaire. Instructions stated: "Below is a collection of statements about your everyday experience. Using the scale provided please indicate how true each statement is of your general experiences. Please answer according to what really reflects your experiences rather than what you think your experiences should be. Please treat each item separately from every other item". The presentation order of items was randomized for each participant and items were paired with a five-point Likert-type scale: 1 = "Not at all true of me", 2 = "Slightly true of me", 3 = "Moderately true of me", 4 = "Very true of me", and 5 = "Extremely true of me".

2.2. Results

2.2.1. Factor and IRT analyses

The purpose of this study is to select a small set of unidimensional items that reliably assess all levels of fear of missing out. In line with this, the analytic approach we adopted to achieve this end was comprised of two steps.

First, we conducted a principle components analysis using a maximum likelihood estimation method including all the 32 candidate items. Preliminary investigation of the data suggested a strong single factor solution, but there were some items that had small suboptimal factor loadings, and others that lowered the overall model fit considerably. Following an iterative process of confirmatory factor analysis we eliminated suboptimal items and retained 25 of the original 32 items. These items produced a good fit to the data, χ^2 (275) = 1778.1, p < .01, RMSEA = .073, SRMR = .056.

Second, to further reduce the number of items while maximizing the sensitivity of the scale to all levels of the fear of missing out, we estimated item parameters using an Item Response Theory (IRT; De Ayala, 2009) approach with PARSCALE (Muraki & Bock, 1998). Specifically, we applied a graded response model to the data and estimated individual item information curves, which describes the amount of information the individual items provides at various points along the latent trait (i.e., fear of missing out) spectrum (Samejima, 1969). From this we were able to identify 10 items that jointly showed high amount of information across a broad range of the FoMO continuum. Fig. 1 provides a graphic depiction of the test information curve – the sum of the individual item information curve – of this final 10-item scale. The latent trait was scaled with mean of 0 and SD = 1.0 and the maximum information were observed at a slightly positive level of the latent trait (θ = .51). This indicates that the final scale is most sensitive to assessing participants with moderate to high fear of missing out. However, overall the curve was quite well distributed, suggesting that this scale can reliably assess participants with a broad range of FoMO (i.e., low, medium, and high). We also computed latent trait scores for participants using the graded response model and correlated them with scale scores computed by averaging the row rating scores of the final 10-item scale. The resulting correlation (r = .95) indicated that overall FoMO scores for individuals could be computed simply by averaging across the raw rating scores (M = 2.56, SD = 0.82). The final scale items, presented in Appendix A, showed good consistency (α = .87), as well as an acceptable distribution in terms of both skewness (0.27) and kurtosis (−0.48).

2.3. Brief conclusion

In this study we recruited a large and diverse sample of participants who rated a pool of items drafted to reflect individual differences in fear of missing out. We pursued a data-driven approach guided by existing views of the phenomenon to create a self-report instrument of FoMO. As a result, we were able to identify ten items

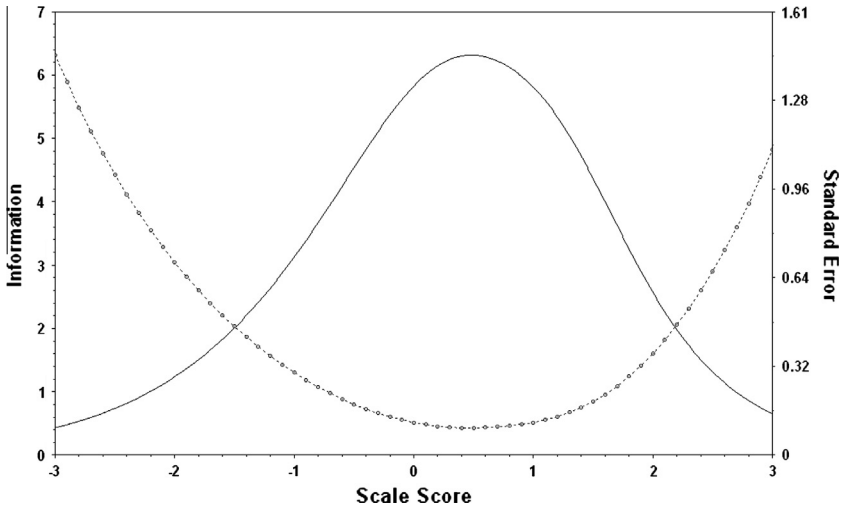

Fig. 1. Total test information curve observed for 10-item FoMO scale in Study 1. *Note*: the dotted like represents standard error and the solid line represents item information as a function of scale scores (i.e. latent trait scores).

that accurately tapped into between-persons variability in FoMO. This assessment, labeled the Fear of Missing Out scale (or FoMOs), is brief and is sensitive to those who evince low, moderate, and high levels of fear of missing out construct as an individual difference.

3. Study 2: FoMO in society

In our second study we recruited a representative adult sample to explore how fear of missing out related to demographics, individual differences, and social media engagement across the general population. Our aims in this study were twofold. First, we wanted to examine how demographic factors, such as age and gender related to FoMO on the population level. Our second goal was to apply the motivational framework of SDT to understand how individual differences in need satisfaction and well-being related social media engagement. This took the form of three research questions.

First we hypothesized that individuals who have had their basic needs for competence, autonomy, and relatedness satisfied on a day-to-day basis would be lower in fear of missing out. Second, we hypothesized that FoMO would be negatively associated with indicators of psychological well-being. That is, we expected that experiencing lower levels of general mood and lower overall life satisfaction would report higher levels of FoMO. Finally, we hypothesized that FoMO is robustly related to social media use. Specifically, we predicted that FoMO would mediate the relations (if any) linking individual variation in basic need satisfaction, general mood, and life satisfaction to behavioral engagement with social media.

3.1. Method

This study was conducted using an online interview administered to participants in the 150,000-person Harris Poll panel of Great Britain. A subset of panelists was selected at random from the base sample and was invited by email to take part in the survey. Data from the weighted responding sample were collected over a 2-week period in late September 2011. This process yielded a nationally representative cohort of 2079 working age adults (1040 men and 1039 women) ranging in age from 22 to 65 ($M = 43.21$, $SD = 11.49$) who completed the measures outlined below.

3.2. Measures

Fear of missing out was assessed using the 10-item Fear of Missing Out scale (FoMOs) developed in Study 1 (see Appendix A). Overall, the scale demonstrated good internal consistency ($\alpha = .90$) and presented acceptable levels of skewness (1.10) and kurtosis (1.05). Scores were computed for each participant by averaging across all ten items ($M = 1.89$, $SD = 0.75$).

Social media engagement was measured with a series of questions assessing the extent to which participants used it in their daily lives. Participants were instructed to: "Please reflect on how you used social media (e.g., Facebook, Twitter, and LinkedIn) in the past week and report the number of times you used it under the circumstances listed below". Participants used a eight-point Likert style scale ranging from 1 = "Not one day last week" to 8 = "Every day last week" to rate five statements: "within 15 min of waking up" ($M = 1.86$, $SD = 1.65$), "when eating breakfast" ($M = 1.66$, $SD = 1.65$), "when eating lunch" ($M = 1.98$, $SD = 1.82$), "when eating dinner" ($M = 1.69$, $SD = 1.63$), and "within 15 min of going to sleep" ($M = 2.15$, $SD = 2.12$). Principle components analyses indicated the five items loaded onto a single factor, explaining 59.27% of the observed variability, so scores were summed to create one social media engagement score for each participant ($\alpha = .82$, $M = 9.33$, $SD = 7.00$).

Psychological need satisfaction was assessed using the nine-item individual difference version of the Need Satisfaction Scale (La Guardia, Ryan, Couchman, & Deci, 2000). Items assessed three kinds of need satisfaction; autonomy, e.g., "I feel free to be who I am", competence, e.g., "I feel very capable and effective", and relatedness, e.g., "I feel a lot of closeness and intimacy with others". We computed need satisfaction scores for each participant by reverse scoring negatively worded items and then averaging across all nine responses ($\alpha = .83$, $M = 3.58$, $SD = 0.73$).

Overall life satisfaction was measured with an assessment that tapped into life satisfaction across four areas by asking: "Thinking about how you feel about your life, please tell us how satisfied you are with the following aspects of your current situation". Participants used a five-point Likert style scale ranging from 1 (not at all) to 5 (very much) to rate four life domains including physical health ($M = 3.49$, $SD = 1.07$), emotional health ($M = 3.65$, $SD = 1.10$), personal relationships ($M = 3.84$, $SD = 1.13$), and life as a whole ($M = 3.70$, $SD = 0.97$). Principle components analyses indicated that the four items loaded onto a single life satisfaction factor, explaining 65.83% of observed variability. As a result, scores across these items were averaged to create a composite life satisfaction score for each participant ($\alpha = .82$, $M = 3.65$, $SD = 0.86$).

General mood was measured using an adapted nine-item version of the Emmons Mood Indicator (Diener & Emmons, 1984). Participants were asked to reflect on the past month of their lives and rate nine emotion adjectives in terms of how frequently they experienced each using five-point Likert scale that ranged from 1 = "never" to 5 = "always". Responses to negatively worded adjectives (e.g. frustrated and depressed) were reverse scored and averaged with values from positively worded adjectives (e.g. joyful and pleased) to compute general mood scores for each participant ($\alpha = .88$, $M = 3.33$, $SD = 0.61$).

3.3. Results

3.3.1. Preliminary analyses

We first explored for main and interactive effects of gender and age on the primary study variables, and correlations between observed variables are presented in Table 1. Overall, FoMO was negatively related to age, $r = -.37$, $p < .001$, and correlations showed males tended to report higher levels of FoMO, $r = -.05$, $p = .01$. These relations were qualified by a significant interaction effect (age X gender), $t(2075) = 2.12$, $p = .03$. Simple slopes analyses indicated that the gender difference observed in levels of FoMO was in evidence only for younger participants, that is, for those aged 1 SD below the mean of the sample, $t(2075) = -3.33$, $p < .001$. In other words, younger participants, and younger men in particular, tended to report the highest levels of FoMO. There was no evidence for gender differences in FoMO among older people. Further correlations showed older participants tended to be less engaged with social media, $r = -.31$, $p < .001$, reported higher levels of need satisfaction, $r = .11$, $p < .001$, and marginally higher levels of overall life satisfaction, $r = .05$, $p = .05$. Accordingly, we statistically controlled for variability in participant age and gender when evaluating our primary research questions.

3.3.2. Need satisfaction and FoMO

To test our hypothesis that individuals who are low in basic psychological need satisfaction would be more likely to experience FoMO, we evaluated a two-step hierarchical regression model. Because our preliminary analyses indicated that participant age and gender co-varied with a number of the observed measures we entered these factors in the first step of the model as control

Table 1
Observed correlations between variables in Study 2.

Variable	1	2	3	4	5	6
1. Age	–					
2. Sex	.00	–				
3. Fear of Missing Out (FoMO)	−.37***	−.05*	–			
4. Psychological need satisfaction	.12***	.02	−.29***	–		
5. Social media engagement	−.31***	.04	.40***	−.12***	–	
6. General mood	.11***	−.03	−.24***	.66***	−.09**	–
7. Overall life satisfaction	.05	.04	−.19***	.67***	−.06**	.66***

Note: $N = 2079$.
* $p < .05$.
** $p < .01$.
*** $p < .001$.

variables. In the second step of the model we entered basic psychological need satisfaction as a predictor of FoMO. Results derived by regressing FoMO onto basic psychological need satisfaction indicated those who evidenced less satisfaction of the needs for competence, autonomy, and relatedness also reported higher levels of fear of missing out, $\beta = -.25$, $p < .001$, a significant trend holding variability in participant age and gender constant.

3.3.3. Well-being and FoMO

We hypothesized that fear of missing out would be negatively associated with general mood and overall levels of life satisfaction across the general population. To test these predictions we created two hierarchical regression models that evaluated links between FoMO and both indicators of psychological well-being controlling for variability in participant age and gender.

3.3.3.1. General mood. To test our expectation that FoMO would be negatively associated with overall levels of mood we regressed FoMO onto general mood scores, holding variability in demographic factors constant. Results indicated that those high in FoMO did indeed report lower levels of general mood, $\beta = -.20$, $p < .001$.

3.3.3.2. Overall life satisfaction. To test our predication that FoMO would be negatively linked to overall life satisfaction we regressed FoMO scores on life satisfaction controlling for demographic variability. Results showed that those who experienced higher levels of FoMO also tended to report lower overall levels of life satisfaction, $\beta = -.17$, $p < .001$.

3.3.4. FoMO and social media engagement

To test our hypothesis that variability in psychological need satisfaction and individual differences in well-being related to social media engagement insofar as they were linked to higher levels of FoMO, we evaluated three mediation models following the bootstrapping approach outlined by Preacher and Hayes (2008). Controlling for participant age and gender, results indicated three total effects relating need satisfaction, $\beta = -.12$, $p < .001$, general mood, $\beta = -.09$, $p < .00$, and life satisfaction, $\beta = -.06$, $p < .01$, to social media engagement were in evidence (the C path in Fig. 2). Likewise, levels of FoMO were predicted by participant standing on need satisfaction, $\beta = -.25$, $p < .001$, mood, $\beta = -.20$, $p < .001$, and life satisfaction, $\beta = -.17$, $p < .001$ (the A path). Across all three mediation models results FoMO was robustly associated with social media engagement, $\beta = .40$, $p < .001$ (B path).

Analyses indicated three significant indirect effects linking individual differences in need satisfaction, mood, and life satisfaction to social media engagement by way of FoMO (the A * B path). Across the three models, this indirect path accounted for an average of 19.39% of variability (R^2) in social media engagement. The 95% confidence intervals for these paths, based on 10,000 resamples, ranged from −0.65 to −1.00 for need satisfaction, −.57 to −.99 for mood, and −.36 to −.61 for life satisfaction. Finally, the models showed the direct effects linking need satisfaction, $\beta = .003$, $p = .89$, general mood, $\beta = -.001$, $p = .98$, and life satisfaction, $\beta = .013$, $p = .51$, to social media engagement were no longer significant when FoMO was considered (the C′ path). Taken together, these results indicate that FoMO served as a mediating factor that explained the relations that linked individual differences in need satisfaction and well-being to social media use.

4. Study 3: affective and behavioral correlates of FoMO

In Study 3 we recruited a sample of young adults to examine how fear of missing out related to emotional experiences of social media and key real-world behaviors. More specifically, this study examined the role FoMO plays in the lives of first-year university students. In addition to conceptually replicating the link between FoMO and social media engagement uncovered in Study 2, we evaluated three additional research questions.

Our first hypothesis concerned the emotional correlates of fear of missing out. Accounts of FoMO suggest that it is characterized by ambivalent feelings regarding social media. As such, we predicted that those high in FoMO would report high levels of both positive affect and negative affect when using Facebook.

Second, we wanted to know if generally high levels of FoMO were associated with greater use of Facebook in educational settings. Given that wireless Internet is now ubiquitous in university lecture halls we suspected this presents a temptation for students. We hypothesized those high in FoMO are more likely to "tune out" of class and log into Facebook.

Finally, we were curious to know if those with high levels of FoMO are more likely to be driven to distraction. Smartphones and other wireless devices now allow social interactions (via email, text messages, and social media) to attract the attention of a driver. Given this new low bar for digital communication in the driver's seat, we predicted those high in FoMO would be more likely to succumb to the temptation to split their attention.

4.1. Methods

A sample of young adult university students was recruited for Study 3. 87 first-year undergraduate students (20 men and 67 women) ranging in age from 18 to 33 ($M = 20.00$, $SD = 2.96$) participated in this study in exchange for course credit.

4.2. Measures

Fear of missing out was assessed using the 10-item fear of missing out scale created in Study 1 and utilized in Study 2. The scale demonstrated optimal internal consistency ($\alpha = .89$) and scores

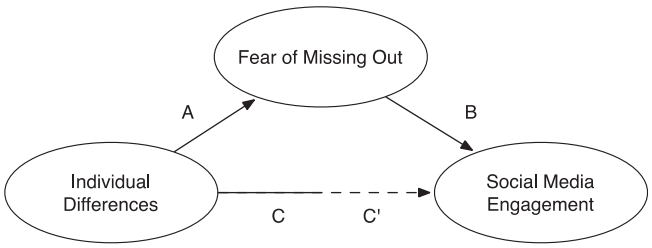

Fig. 2. Mediation model.

were computed for each participant by averaging across all ten items ($M = 2.37$, $SD = 0.84$).

Facebook engagement was measured using a slightly re-worded version of the five items used to measure social media engagement in Study 2. In place of asking about social media use in general, these questions asked about Facebook in particular, during meals (breakfast, lunch, and dinner) and within 15 min of waking and going to sleep. These five values were summed to create one Facebook engagement score for each participant ($\alpha = .89$, $M = 11.92$, $SD = 9.54$).

Ambivalent emotional experiences when using Facebook were assessed using a brief 10-item version of the PANAS-X (Watson & Clark, 1994). Participants used a five point Likert type scale that ranged from 1 = "not at all" to 5 = extremely" to rate five positive and five negative emotion adjectives in terms of the extent to which they experienced each when using Facebook in the past week. Separate positive ($\alpha = .85$, $M = 2.30$, $SD = 0.78$), and negative affect ($\alpha = .85$, $M = 2.30$, $SD = 0.78$), scores were computed for each participant.

Distracted learning was assessed using a single item question that asked participant to report on the number of lectures they used Facebook in during the past week. Participants used a six-point Likert style scale that ranged from 0 = "No lectures" to 5 = "Five lectures" to evaluate this item. Although the majority of participants ($n = 64$) reported they did not use Facebook at all during lectures, more than a quarter of the sample used Facebook during class between one and five times ($M = 0.52$, $SD = 1.02$).

Distracted driving was measured using a series of questions asking if they had recently engaged in a set of unsafe behaviors while driving a car. Of the total sample, 71% of participants ($n = 62$) were regular drivers. These participants were instructed to: "Think back over the past 3 months, how often have you experienced the following as a driver?" Participants used a four-point Likert style ranging from 1 = "No", 2 = "Yes, Once or Twice", 3 = "Yes, Occasionally", 4 = "Yes Often" to respond to four behaviors: "Texting/emailing and driving" ($M = 1.38$, $SD = 0.78$), "Texting/emailing at light" ($M = 1.76$, $SD = 0.99$), "Glancing at phone and driving" ($M = 1.87$, $SD = 0.92$), and "Glancing at phone at light" ($M = 2.41$, $SD = 1.12$). Principle components analyses indicated the four items loaded on a single factor, explaining 56.68% of the observed variability, so scores were summed to create one distracted driving score for each participant ($\alpha = .84$, $M = 1.86$, $SD = 0.78$).

4.3. Results

4.3.1. Preliminary analyses

There were no main or interacting effects observed between participant age or gender on the other variables we assessed.

4.3.2. FoMO and Facebook engagement

To test the hypothesis that fear of missing out would be positively related to Facebook engagement we regressed engagement, $\beta = .41$, $p < .001$, onto FoMO scores. Fear of missing out was indeed related to greater engagement with Facebook at key times in the day.

4.3.3. FoMO and ambivalent emotions when using Facebook

To evaluate our prediction that FoMO would be associated with high levels of ambivalent emotions when using Facebook use we regressed positive affect, $\beta = .31$, $p < .001$, and negative affect, $\beta = .40$, $p < .001$, on FoMO scores. This pattern of relations indicated those high in FoMO were more likely to experienced mixed feelings when using social media.

4.3.4. FoMO and distracted learning

To test our expectation that FoMO would be associated with the use of Facebook during university lectures we regressed participant standing on distracted learning, $\beta = .27$, $p = .013$, onto fear of missing out scores. This analysis showed that students high in FoMO were more liable to use Facebook during university lectures.

4.3.5. FoMO and distracted driving

To evaluate our hypothesis that FoMO would be related to more frequent use of mobile communications technology when driving we regressed distracted driving scores, $\beta = .28$, $p = .029$, onto FoMO. Young adults who were high in fear of missing out paid greater attention to emails, text messages, and their mobile phones when driving compared to those lower on FoMO.

5. Discussion

5.1. Summary

Social media utilities have made it easier than ever to know what one's friends, family, and acquaintances are doing, buying, and talking about. In many ways these social affordances are positive, highlighting opportunities and connecting people. However, because time is limited, this means people must also miss out on a substantial subset of potentially rewarding experiences made salient by social media use. This double-edged quality of social media has driven popular interest in and increased speculation about the nature of fear of missing out. Although little is empirically known about fear of missing out at this stage, the present research provides a number of insights into how fear of missing out can be reliably assessed and how it constellates with motivational, behavioral, well-being, and demographic factors.

In the first study we recruited a large and diverse sample of participants who rated a pool of items drafted to reflect individual differences in fear of missing out. Guided by our consideration of the extant writings about the phenomenon we pursued an empirically rigorous and data-driven approach to create a self-report measure. As a result of strategic item selection and testing we identified ten items that form a new psychometric instrument to tap into individual differences in FoMO. This first of its kind assessment, the FoMOs, is a brief and easy to administer assessment that is sensitive and quantifies FoMO for those who evince low, moderate, and high levels of the fear of missing out construct.

In the second study we collected a larger, nationally representative sample and investigated fear of missing out against the backdrop of SDT, a macro theory of human motivation and extant research exploring motives for social media use. Our goal was to investigate demographic variability in FoMO as well as to understand its links to motivational and well-being factors. Results indicated that the young, and young males in particular, tended towards higher levels of FoMO. This pair of findings conceptually replicated and lends empirical weight to earlier industry reports (JWT, 2011, 2012) that suggested FoMO tends to be a phenomenon grappled with by younger people.

Results derived in Study 2 indicated that motivational factors key to understanding human behavior in the relationship (Patrick, Knee, Canevello, & Lonsbary, 2007), video gaming (Przybylski, Weinstein, Ryan, & Rigby, 2009) and sporting domains (Hagger & Chatzisarantis, 2007) are also important for FoMO. Namely, individuals who evidenced less satisfaction of the basic psychological needs for competence (efficacy), autonomy (meaningful choice), and relatedness (connectedness to others) also reported higher levels of FoMO. The present research suggests that low levels of psychological need satisfaction, identified by studies as a vulnerability factor for behavioral disregulation in other areas, may also constitute a risk factor for fear of missing out. The study also examined the links between fear of missing out and psychological well-being. Results derived in the second study support the speculations shared by writers (Morford, 2010; Wortham, 2011) as well as qualitative evidence reported by theorists (Turkle, 2011) that fear of missing out may be associated with negative experiences. Results showed that FoMO was negatively associated with both general mood and overall life satisfaction, links that remained in evidence holding demographic variability constant. These findings support earlier research indicating the elevation of negative social and emotional states such as boredom and loneliness linked to social media usage also relate to FoMO (Burke et al., 2010; Lampe et al., 2007).

Most importantly, Study 2 examined the links between fear of missing out and social media engagement. Given that social media provides relatively frictionless avenues for getting and staying in the know (Ellison et al., 2007), we tested expectation that those high in FoMO would aggressively seek out opportunities to engage social media. Further, we also evaluated the mediating role fear of missing out plays in linking individual differences to social media use. Findings derived using mediation analyses indicated that lower levels of need satisfaction, general mood, and overall life satisfaction related to seeking out social media engagement only insofar as they related to higher overall levels of FoMO. Said differently, Study 2 showed that fear of missing played a key and robust role in explaining social media engagement over and above the other factors we considered.

Finally, Study 3 focused on specific behavioral correlates of FoMO in young adults. In particular we were interested in how fear of missing out would relate to overall levels of and feelings about Facebook use, the use of social media utilities during university lectures, and its links to distracted driving. Results conceptually replicated findings from Study 2, those high in FoMO tended to use Facebook more often immediately after waking, before going to sleep, and during meals. Students high in FoMO reported ambivalent feelings towards social media and were more likely to use Facebook during their university lectures. Lastly, we found that those high in fear of missing out were more likely to give into the temptation of composing and checking text messages and emails while operating motor vehicles.

5.2. Directions for future research

The present work features limitations that merit mention and open avenues for future research. First and foremost, because the data used for the present studies were collected through one-time surveys, they reflect snapshots of individuals in time. As such, future work examining FoMO in experimental settings will be valuable and allow for causal models to be evaluated. For example, as an individual difference factor, FoMO lends itself well to a moderating role in person by situation interactions. Second, the present research examined FoMO as an individual difference and provides little information about the temporal and contextual stability of fear of missing out. Like many other stable constructs (e.g., self-esteem; Kernis, 2003), it is reasonable to expect situational and relational factors may influence variability in FoMO across months, weeks, or even the course of the day. Finally, future research should examine FoMOs' place among a wider nomological web of constructs. The present findings indicated that FoMO varied in terms of individual demographics like age and gender, future work evaluating how it constellates with a wider range of factors, such as personality constructs like the Big-5 (Poropat, 2009).

5.3. Closing remarks

As the pace of life online and offline become increasingly intertwined, people are advantaged by, and sometimes struggle with, increasingly rich opportunities for interaction and leisure. Fear of missing out provides a salient example of how this trend towards frictionless online sharing can foster ambivalence about social media. The present work represents the first empirically based and theoretically grounded examination of the fear of missing out phenomenon. Fear of missing out can be directly and accurately measured and does not arise in a vacuum. Our findings show those with low levels of satisfaction of the fundamental needs for competence, autonomy, and relatedness tend towards higher levels of fear of missing out as do those with lower levels of general mood and overall life satisfaction. FoMO is associated with higher levels of behavioral engagement with social media, possibly to the detriment of learning outcomes and driver safety. We believe the present research constitutes the first of many important investigations of fear of missing out.

Appendix A. The final 10-item version of the Fear of Missing Out scale (FoMOs)

Below is a collection of statements about your everyday experience. Using the scale provided please indicate how true each statement is of your general experiences. Please answer according to what really reflects your experiences rather than what you think your experiences should be. Please treat each item separately from every other item.

Not at all true of me	Slightly true of me	Moderately true of me	Very true of me	Extremely true of me
1	2	3	4	5

1. I fear others have more rewarding experiences than me.
2. I fear my friends have more rewarding experiences than me.
3. I get worried when I find out my friends are having fun without me.
4. I get anxious when I don't know what my friends are up to.
5. It is important that I understand my friends "in jokes".
6. Sometimes, I wonder if I spend too much time keeping up with what is going on.
7. It bothers me when I miss an opportunity to meet up with friends.
8. When I have a good time it is important for me to share the details online (e.g. updating status).
9. When I miss out on a planned get-together it bothers me.
10. When I go on vacation, I continue to keep tabs on what my friends are doing.

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