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► **To cite this version:**

Nina Harren, Vera Walburg, Henri Chabrol. Studying Social Media Burnout and Problematic Social Media use: The implication of perfectionism and metacognitions. *Computers in Human Behavior Reports*, 2021, 4, 10.1016/j.chbr.2021.100117. hal-04132137

HAL Id: hal-04132137

<https://hal.science/hal-04132137>

Submitted on 22 Jul 2024

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Title: Studying Social Media Burnout and Problematic Social Media use: the implication of perfectionism and metacognitions

*a Nina Harren (PhD Student in Clinical Psychology, Clinical Psychologist)

b Vera Walburg (University Professor in Psychopathology)

a Henri Chabrol (University Professor in Psychopathology)

a CERPPS (Centre d'Études et des Recherches en Psychopathologie et Psychologie de la Santé), Université de Toulouse Jean Jaurès, UT2J, Maison de la Recherche, 5, Allées Antonio-Machado, 31058 Toulouse Cedex 9, France

b CERES (Culture, Éthique, Religion et Société), Faculté Libre des Sciences Humaines et des Lettres, Institut Catholique de Toulouse (ICT), 3 Rue de la Fonderie, BP 7012 F, 31068 Toulouse Cedex 7, France

* Author for correspondence: Nina Harren (CERPPS (Centre d'Études et des Recherches en Psychopathologie et Psychologie de la Santé), Université de Toulouse Jean Jaurès, UT2J, Maison de la Recherche, 5, Allées Antonio-Machado, 31058 Toulouse Cedex 9, France : +33 6 30 33 41 44 ; n.harren.psy@gmail.com)

1. Introduction

Although Social Media (SM) use significantly increased these past decades, growing evidence revealed use discontinuance of SM platforms resulting from overload and exhaustion (Maier, Laumer, Eckhardt, & Weitzel, 2015; Fu, Li, Liu, Pirkkalainen, & Salo, 2020). Information overload on SM induced stress-related conditions and fatigue, which was often involved in platforms such as Facebook or instant messaging (Bright, Kleiser, & Grau, 2015; Cramer, Song, & Drent, 2016; Dhir, Yossatorn, Kaur, & Chen, 2018; Liu & Ma, 2018; Han, 2018; Shin & Shin, 2016). Online media can be experienced as invasive (Syvertsen, 2020), and prolonged exposure to other user's posts and solicitations via SM were found to cause irritation, stress and "technostress", and feelings of being overwhelmed and exhausted (Maier, Laumer, Eckhardt, & Weitzel, 2012; Shi, Yu, Wang, Cheng, & Cao, 2020). This is arguably reinforced by the widespread use of Internet on multiple devices and interdependence of applications. For instance, smartphones allowed to be reachable at any time (Barley, Meyerson, & Grodal, 2011; Maier et al., 2012; Sanz-Blas, Buzova, & Miquel-Romero, 2019), and emails are also accessible on multiple devices and is required to consult and activate use of other services (Syvertsen, 2020).

There has been increasing interest in studying Social Media Burnout (SMB), also referred to as Social Media fatigue (Bright et al., 2015; Dhir et al., 2019), Facebook fatigue (Cramer et al., 2016), or Social Networking Services fatigue (Lee, Son, & Kim, 2016). Indeed, SMB being a relatively new concept, there is not yet a consensus regarding its definition or its official terminology (Liu & Ma, 2018), for simplicity and continuity, this present study referred to the term SMB. This was characterized by a reduced interest in logging in to SM (Han, 2018), and an eagerness to recede from SM (Liu & Ma, 2018). In literature, three highlighted key elements in SMB were emotional exhaustion, ambivalence, and depersonalization (Han, 2018), inspired from original conceptualizations of occupational

burnout (Maslach & Jackson, 1981). According to Han's definition of SMB (2018), exhaustion corresponds to the degree to which the individual would acknowledge consumption of personal resources by SM use (e.g. time, energy), ambivalence was the ambiguity between favorable and negative outcomes of SM, and depersonalization is the emotional distance between the individual and the SM platform in result of exhaustion. A recent study approached characteristics of SM fatigue from a cognitive (e.g. cognitive overload), behavioral (e.g. feeling less motivated to recommend their profile to other users, forgetfulness, delaying its use), and emotional perspective (e.g. feeling exhausted, anxious, irritated, tiredness, boredom) by the creation of a scale (Zhang et al., 2021).

SMB was mostly studied from the perspective of overload (e.g. system feature overload, information overload, social overload) (Maier et al., 2015), since this appears to be a legitimate entry to the development of SMB. Higher privacy concern (worry that SM may leak private information) and less SM confidence (believing that SM can be used in an effective manner) were shown to predict SM fatigue (Bright et al., 2015; Zhang et al., 2021, p 2). Main sources of exhaustion were suggested to be SM addiction, envy, and SM anxiety, which were shown to be significant predictors for SMB (Liu & Ma, 2018), presumably in relation to overexposure to different kinds of publications and online solicitations. It was also suggested that boredom proneness was highly implicated in information overload and SM fatigue (Whelan, Najmul Islam, & Brooks, 2020), and social comparison and motivation for social comparison were implicated in Facebook fatigue (Cramer et al., 2016).

Today's studies on SMB mainly focus on determining clinical signs, identifying factors that lead to SMB, and creating appropriate measurement tools (Zhang et al., 2021). This present study aimed to complete research on SMB by identifying new explanatory hypotheses for the occurrence of this new phenomenon.

First of all, previous results on the connection between SM addiction and SMB (Liu & Ma, 2018), encouraged us to verify these results from the perspective of problematic Facebook use (PFU) and problematic Instagram use (PIgU). In literature, Facebook fatigue was evaluated as an individual phenomenon (Cramer et al., 2016; Lee, Lee, Sung, & Song, 2019), while recent findings established that PIgU mediated the impact of overuse on emotional fatigue (Sanz-Blas et al., 2019). Now that the study of SMB is still in its early stage, comparing two different types of problematic social media use (PSM) may avoid future conflicting results.

Secondly, this study aimed to investigate the relationship of perfectionism with PSM and SMB. Social comparison was implicated in Facebook fatigue (Cramer et al., 2016), and perfectionism was shown to predict social comparison on Instagram and Facebook (McComb, & Mills, 2021; Padoa, Berle, & Roberts, 2018), perfectionism on SM being associated to domains such as physical appearance (McComb, & Mills, 2021; Yang & Stoeber, 2012), and parenting (Padoa et al., 2018). Recent literature on SM comparison highlighted the risk of frustration, envy, and self-improvement intention that may occur from non-stop attempts to live up to the ideal presentation of others, accompanied by SM fatigue (Cramer et al., 2016; Latif et al., 2020), depressive symptoms (Wang, Wang, Hu et al., 2020) and negative body image (Fardouly & Holland, 2018; Tiggeman & Anderberg, 2020). In addition, social comparison on SM was found to affect subjective well-being and happiness (Wirtz et al. 2020). Viewing positive posts of other unknown users on Instagram decreased positive affect (de Vries, Möller, Wieringa, Eigenraam, & Hamelink, 2018), and perfectionistic self-promotion on SM was associated to greater stress and anxiety (Hellman, 2016). Indeed, SM allowed new ways of transmitting various societal ideals (e.g. appearance based, health, wellness, sexuality) which were broadly investigated in literature (Baker, 2019; Goldsmith, Dunkley, Dang, & Gorzalka, 2017; Huxley, Halliwell, & Clarke, 2015; Monks, Costello,

Dare, Reid Boyd, 2020; Prichard, McLachlan, Lavis, & Tiggeman, 2018; Sniewski & Farvid, 2019; Vendemia & DeAndrea, 2021). As SM comparison was shown to be associated to perfectionist traits, and social comparison was shown to be associated to SM fatigue, we believe that perfectionism may be associated to PSM and SMB.

Finally, studies on the cognitive perspective on SM fatigue mainly revolved around overload (Zhang et al., 2021; Maier et al., 2015), and requires, in our opinion, more attention. The novelty of SMB as its own construct and the limited existing literature encouraged this present exploratory study to also investigate the relationship of SMB with metacognitions and online cognitions. What motivated this prospect of research was the suggestion that PSM was a predictor for SMB (Liu & Ma, 2018), which encouraged this present study to consider some of the recent results found between metacognitions, online cognitions, and PSM, as indicators for research on SMB. As such, metacognitions were found to be associated with PSM (Balıkçı et al., 2020; Casale, Rugai, & Fioravanti, 2018; Marino, Vieno, Moss, et al., 2016), and an important focus was given to online cognitions in cognitive and behavioral treatment for PIU (Caplan, 2002, 2005; 2010; Davis, 2001; Kim et al., 2018; Ting, Ming, de Run, & Choo, 2015; Young, 2013; Zajac, Ginley, Chang, & Petry, 2017; Zhang, Zhang, & Xu, 2019). In addition, it was recently found that high privacy concerns, self-disclosure, parental encouragement, and worry were positively associated with SM fatigue and Mobile Instant Messaging fatigue (Dhir, Kaur, Chen, & Pallesen, 2019). Given that metacognitive beliefs were shown to trigger and maintain rumination and worry (Kannis-Dymand, Carter, Lane, & Innes, 2019, p. 2), this present study chose to investigate metacognitions' relationship to SMB, and also verified the relationship of metacognitions with PSM variables. Literature related to each of these objectives were developed in the following sections.

1.1. Problematic Social Media use

Most users log in to SM for communicating with others and sharing information which can have positive outcomes (Baumer, 2013). The terms social networking site (SNS) and SM were used interchangeably in literature, although SM is actually an umbrella term for multiple online social applications (Aydın, Güçlü, Ünal-Aydın, & Spada, 2020; Kuss & Griffiths, 2017), such as collaborative projects, weblogs, content communities, virtual game worlds, and virtual social worlds (Kaplan & Haenlein, 2010), including social networking which concerns online-interacting with other users (e.g. Facebook, Instagram, Snapchat, WhatsApp) (Kuss & Griffiths, 2017).

A minority of SM users developed PSM (Kuss & Griffiths, 2017), also referred to as “SM addiction”. This present study chose to employ the term PSM, given there is not yet a consensus about how to conceptualize it (Paakkari, Tynjälä, Lahti, Ojala, & Lyyra, 2021). PSM was considered a subtype of problematic Internet use (PIU) (Davis, 2001; Starcevic, 2013), knowing that PIU is an umbrella term for multiple activities that can be engaged in online (e.g. online gaming, online sexual activities, information collection activities, SM, online dating, online shopping) (Bonilla-Zorita, Griffiths, & Kuss, 2020; Ramón Barrada, Ruiz-Gómez, Belén Correa, & Castro, 2019; Király & Demetrovics, 2021; Zhang et al., 2019). PIU was referenced as a new behavioral addiction, also designated as “Internet Addiction” (Fernandes, Maia, & Pontes, 2019), implying similar criteria as substance addiction such as tolerance, withdrawal, repeated failure to reduce or quit the activity, and impairment in daily life (Kurniasanti, Assandi, Ismail, Nasrun, & Wiguna, 2019). There is an inevitable relationship between PSM and PIU (Tao et al., 2010; Young, 1998; Young, Pistner, O’Mara, & Buchanan, 1999), as being on SM requires Internet use and was shown to increase the probability of developing PIU (Lehmann & Konstam, 2011; Senormancı et al., 2014). However, literature suggested that PSM might also be a legitimate disorder on its own

(American Psychiatric Association, 2013; Pantic, 2014; Ryan, Chester, Reece, & Xenos, 2014; van den Eijnden, Lemmens, & Valkenburg, 2016).

PSM was defined as being overly concerned by SM, having a strong motivation to log on, and a loss of control over one's SM use and using it to an extent that interferes with social, scholar, professional aspects, and psychological well-being (Ryan et al., 2014; Fioravanti, Flett, Hewitt, Rugai, & Casale, 2020). The six-component addiction model (salience, tolerance, mood modification, relapse, withdrawal, and conflict) was used to conceptualize PSM (Griffiths, 2005; Paakkari et al., 2021), which was also used to define problematic Tinder use (Orosz, Tóth-Király, Bóthe, & Melher, 2016), and PSNS (Andreassen et al., 2016). PSM was also defined using an adaptation of criteria for Internet Gaming Disorder defined in the Diagnostic and Statistical Manual of Mental Disorders (*DSM-V*): preoccupation, withdrawal, tolerance, problems with reducing, giving up other activities, continuance despite the problems, covering up, use to escape from negative moods, risk of loss regarding relationships and opportunities (APA, 2013; Paakkari et al., 2021). This present study assessed two different PSM measures in relation to SMB, as PSM was found to occur when it is used as a means of coping with stress-related issues (Xu & Tan, 2012), and was found to predict SMB in previous studies (Liu & Ma, 2018).

1.1. Role of metacognitions and cognitions in Internet-related disorders

Literature in the addiction field outlined the involvement of cognitions and metacognitions in addictive behavior (Beck, Wright, Newman, & Liese, 1993; Spada, Caselli, Nikčević, & Wells, 2015). Indeed, thought patterns were shown to contribute to maintaining addictions and trigger cravings (Chabrol, Massot, Chouicha, Montovany, & Rogé, 2001; Hautekeete, Cousin, & Graziani, 1999; Tison & Hautekeete, 1998), as metacognitions were involved in self-regulation processes (Spada, Caselli, Nikčević, & Wells, 2015; Spada & Wells, 2009). Indeed, activation of metacognitions implies evaluation, judgment, and

influence over one's own thought processes, which is automatic and involuntary most of the time (Norman et al., 2019). A simple way to define activation of metacognitions is the action of having thoughts about one's thoughts and cognitions (Flavell, 1979), allowing individuals to reflect on their own cognitive experiences, which has a function of monitoring thought processes and regulating them (Norman et al., 2019).

A growing body of studies highlighted the mediating role of metacognition between negative emotions and addictions (Spada, Nikčević, Moneta, & Wells, 2007; Spada, Caselli, Nikčević, & Wells, 2015), including PIU (Akbari, 2017; Spada, Langston, Nikčević, & Moneta, 2008; Spada & Morino, 2017), PFU (Marino, Vieno, Moss, et al., 2016), and SM in general (Balıkçı et al., 2020; Casale, Rugai, & Fioravanti, 2018). More practically, it was suggested that metacognitions intensified the occurrence of negative emotions, which increased the likelihood of engaging in different types of PIU to self-regulate (Marino, Marci, Ferrante, et al., 2019; Akbari, 2017; Spada, Nikčević, Moneta, & Wells, 2008). To our knowledge, no former studies have yet measured metacognitions in relation to PIgU nor to SMB, which was one of the exploratory aims of this present study.

This present study investigated online cognitions which differed from metacognitions. Online cognitions correspond to thoughts and beliefs about online behaviors (Davis, Flett, & Besser, 2002), and metacognitions were not specifically focused on online behaviors and designated thoughts about cognitive processes. In literature, there *were* studies on online gaming metacognitions, in which positive metacognitions correspond to the perceived positive benefits of using online gaming as a cognitive and affective regulatory strategy ("online gaming will stop my worry") and negative metacognitions about the uncontrollability and dangers of thoughts ("thoughts about gaming interfere with my functioning") (Caselli, Marino, & Spada, 2020, p. 174), and scales were designed to measure specific online gaming metacognitions (Spada & Caselli, 2017). For PIU, there was no specific measure for online

metacognitions, although certain studies measured positive metacognitions about PIU (e.g. escapism and uncontrollability) through the distraction subscale of the online cognition scale (OCS; Davis et al., 2002), which was used for this present study.

Online cognitions about individual's personal Internet use were studied broadly (Caplan, 2002, 2005; 2010; Davis, 2001; Sebre, Miltuze, & Limonovs, 2020; Wegmann, Oberst, Stodt, & Brand, 2017), and is one important focus of cognitive and behavioral treatments for Internet-related disorders (Kim et al., 2018; Ting et al., 2015; Young, 2013; Zhang, et al., 2019; Zajac et al., 2017). Screening of online cognitions is essential for identifying thoughts about dimensions of PIU and online behaviors (e.g. diminished impulse-control, loneliness and depression, social comfort, distraction) (Davis et al., 2002), giving a look on the individual's perception of the situation (Zhang et al., 2019). Online cognitions were also found to contribute to normalizing excessive use of online activities (Ting et al., 2015), and increase Internet-expectancy which might lead to development and maintenance of PIU (Brand, Young, Laier, Wölfling, & Potenza, 2016; Liu, Fang, Wang, & Zhou, 2016).

Given that metacognitions, online metacognitions, and online cognitions, are essential in understanding different types of PIU, and that they contribute to maintaining PIU, trigger cravings, help self-regulating online behaviors, it seems also essential to investigate metacognitions and online cognitions with SMB.

1.2. Social Media and Perfectionism

Perfectionism is a personality trait reflecting an individual's excessively high standards for their performance accompanied by high critical self-evaluation (Senormancı et al., 2014; Frost, Marten, Lahart, & Rosenblate, 1990), which may appear at any age (Melero, Morales, Espada, Fernández-Martínez, & Orgilés, 2020). It was conceptualized that perfectionism was multidimensional as it can be either socially prescribed, self-directed, and oriented towards others (Hewitt & Flett, 1991). Other studies have indicated two traits in perfectionism that

were perfectionistic strivings and perfectionistic concerns (Bieling, Israeli, & Antony, 2004; Stoeber, 2018). Indeed, perfectionism can either be functional or dysfunctional which impacts the outcome of such behaviors (Frost et al., 1990; Stoeber & Otto, 2006), as the way of experiencing success and coping with failure (Levine, Werner, Capaldi, & Milyavskaya, 2017). Perfectionistic strivings were suggested to be adaptive or “healthy” and perfectionistic concerns were considered maladaptive or “unhealthy” (Bieling et al., 2004). Maladaptive perfectionism was identified as a maintaining factor for multiple psychological disorders (Limburg, Watson, Hagger, & Egan, 2016), such as anxiety, depression, and eating disorders (Egan, Wade, & Shafran, 2011), and is a component of obsessive-compulsive personality disorder (American Psychiatric Association, 2013; Sarafraz, Hemmati, & Asadi-Lari, 2020). This present study hypothesizes that perfectionism may also contribute to SMB.

Indeed, SM has evolved throughout the years and has become a popular way for self-expression (Hawi & Samaha, 2017), and a new way of promoting products and lifestyles for influencers on platforms such as Instagram (Pilgrim & Bohnet-Joschko, 2019). SM was argued to be mostly used to satisfy the need for belonging and self-presentation (Casale, Fioravanti, & Rugai, 2016), and the platform’s features allowed individuals to have greater control over self-disclosure (Valkenburg & Peter, 2011), for example, by offering correcting features and filters to improve pictures (Sedera & Lokuge, 2020). This stressed the risk of confusing real life and an ideal self-image created online which may lead to perfectionism (Griffiths & Balakrishan, 2018; Hellman, 2016; Senormarci et al., 2014), especially with individuals that prefer online social interaction (Fioravanti et al., 2020). Perfectionism on SM was associated to domains such as physical appearance (Yang & Stoeber, 2012; McComb, & Mills, 2021), parenting (Padoa et al., 2018), and may concern multiple other domains.

It was argued that technology influenced society to be less indulgent with imperfections (Sedera & Lokuge, 2020), referring to the term “atelophobia” which designated

the intolerance of imperfection (Fatah, 2017), and gives an experiential look at perfectionism by highlighting the major internal investments that individuals engaged in to live up to personal standards (Paravati, 2015). About a decade ago, studies started to determine a link between perfectionism and Internet addiction (Casale, Fioravanti, Flett, & Hewitt, 2014; Lehmann & Konstam, 2011), and very recently, “digital perfectionism” was introduced as a new technology-driven mental disorder, conceptualized in four main components which were mistake uneasiness, disproportionate standards, criticism antipathy, and excessive orderliness (Sedera & Lokuge, 2020).

1.3. Focus of this present study

The focus of this present study was to investigate the relationship between PIgU, PFU, perfectionism, metacognitions, online cognitions, and SMB. The impact of PIgU, PFU, perfectionism, metacognitions, and online cognitions on SMB was investigated. As studies on SMB are still in their infancy, it is essential to investigate potentially implicated components with SMB, in order to offer adequate help to concerned individuals. Based on the previously described literature, the following question and hypotheses were formulated to guide this present research: ***RQ: What are the relations between PIgU, PFU, perfectionism, metacognitions, online cognitions, and SMB?***

Although it was suggested that individuals may feel overloaded by SM even when their use is minimal (Shi et al., 2020), the compulsive and problematic relationship that individuals may maintain with SM in case of PSM (e.g. time spent thinking about being online, tolerance, withdrawal, failure to reduce the activity, loss of control) (Fioravanti et al., 2020; Griffiths, 2005; Kurniasanti et al., 2019; Paakkari et al., 2021), including maladaptive online cognitions about the self and the world in regards to being online, that was included in PIU (Caplan, 2002, 2005, 2010; Davis, 2001; Davis et al., 2002), might hinder reduction of Instagram use and Facebook use, and thereby increase overload and exhaustion.

H1: It was expected that PSM variables and activation of online cognitions would be associated to SMB, and that they would significantly impact SMB.

It was argued that students were broadly exposed to SM given that these are often integrated in educational contexts, commonly used by teachers to transmit information (e.g. schedules, homework), often deliberately used by students in general to keep up with their homework or presentations, and for socializing purposes (Shi et al., 2020; Grau, Kleiser, & Bright, 2019). This may result in technostress and emotional exhaustion, negatively impacting academic performance (Shi et al., 2020), or socio-professional pressure to be “technologically intelligent” (Gupta, 2019). Millennials were designated as being more at risk for developing Internet-related disorders because they have not necessarily known a world without technology compared to older generations (Grau et al., 2019).

H2: Students and younger individuals of the sample are expected to obtain higher scores of PSM, activation of online cognitions, and SMB.

This present study addresses PSM variables and perfectionism as potential sources of exhaustion and ambivalence of SMB, especially through the prism of social comparison and desire for self-improvement that was associated with SM fatigue (Cramer et al., 2016; Latif et al., 2020). Indeed, SM is an ideal environment for self-comparison. Particularly on platforms like Instagram, of which publications are often appearance-focused (e.g. body, lifestyle, travel, success, parenting), and Facebook where individuals were found to mostly share positive posts about themselves (Cramer et al., 2016). Perfectionism predicted social comparison on Instagram and Facebook (Padoa et al., 2018; McComb, & Mills, 2021), and recent literature suggested that technology use such as SM increased intolerance to imperfection (Sedera & Lokuge, 2020; Fatah, 2017). Moreover, it was argued that perfectionism was related to emotional exhaustion (Kanten & Yesiltas, 2015), was involved in stress-related processes, and was one of the most important factors in predicting occupational

burnout (Chang & Lee, 2020; Chang, Seong, & Lee, 2020; Hill & Curran, 2015; Luo, Wang, Zhang, Chen, & Quan, 2016; Robakowska, Tyrańska-Fobke, Walkiewicz, & Tartas, 2018). Although these results concern “offline” burnout, online platforms sometimes tend to mirror offline behaviors.

H3: Perfectionism is expected to be associated to PSM variables and SMB, and perfectionism is expected to impact SMB.

Metacognitions and perfectionism were found to both be associated with disorders such as Obsessive-Compulsive Disorder (OCD) (Grøtte et al., 2015), job burnout (Fakhri et al., 2020), and anxiety and depression (Kannis-Dymand, Hughes, Carter, & Love, 2020). More precisely, on studies on anxiety and depression, metacognitions predicted perseverance behaviors in perfectionism, that metacognitive beliefs indirectly impacted anxiety through perseverance behaviors, and it was suggested that individuals that have high levels of perfectionism are more likely to present positive metacognitive beliefs about repetitive thinking in an attempt to protect themselves from perceived threats to their self-image (Kannis-Dymand et al., 2020, p. 10).

H4: Metacognitions and perfectionism are expected to be positively associated.

This present study explored the possibility that metacognitions may be related to SMB, which has not been done before to our knowledge. What motivates this prospect of research was the extended proof of the interference of metacognitions with PIU and PSM (Akbari, 2017; Balıkcı et al., 2020; Casale, Rugai, & Fioravanti, 2018; Marino et al., 2016; Spada, Caselli, Nikčević, & Wells, 2015; Spada & Morino, 2017), and the relationship between PIU and PSM with SMB (Sanz-Blas et al., 2019; Liu & Ma, 2018). Self-monitoring and regulating may be a key element in understanding SMB, as SNS fatigue was defined as the subjective and self-evaluated feeling of tiredness related to use of those platforms (Lee et al., 2016). Factors that were shown to be implicated in various forms of SM fatigue seemed to

be related to a search for control, and worry about personal Internet use (Dhir et al., 2019), which might be related to metacognitive beliefs that were shown to trigger and maintain rumination and worry (Kannis-Dymand et al., , 2019, p. 2). Therefore, we have reason to believe that metacognitions are implicated in SMB.

H5: Metacognitions are positively associated to SMB, and impact SMB.

2. Material and methods

2.1. Sample

A total of 1845 individuals responded to the survey among 825 were retained for data analysis, since 1020 of the surveys were incomplete and removed from the study. Participants were aged between 18 and 75 years old ($N= 815$; $M=30.1$; $SD=11.9$), including 125 (15%) male participants and 700 (85%) female participants.

Table 1

Sociodemographic information

N = 825	Frequency	Proportion %
<i>Sex</i>		
Female	700	85
Male	125	15
<i>History of addictions</i>		
Yes	241	29
No	584	71
<i>Professional category</i>		
Student	431	52
Employee	112	13.6
Civil servant	96	11.6
Executive	61	7.4
Intermediate professions	43	5
Retired	27	3
Unemployed	33	4
Company director	17	2
Commercials	5	1
<i>Primary activity on the Internet</i>		
Social Media	407	49
Leisure	199	24
Work	144	17
Online gaming	38	5
Online shopping	29	3.5
Dating networks	6	1

Pornography	2	0.5
<i>Internet use for work</i>		
Yes	652	79
No	173	21
<i>Instagram for work</i>		
Yes	100	12
No	725	87
<i>Facebook account</i>		
Yes	819	99
No	6	1
<i>Instagram account</i>		
Yes	574	69
No	251	31
<i>Age</i>	30 (Mean)	11.9 (SD)

Table 1 presents sociodemographic characteristics. The most carried out activities were SM, leisure activities, and work. Practically the whole sample was on Facebook and a majority was on Instagram. Half of the sample were students.

2.2. Procedure

The study was designed in accordance with ethical guidelines of the Helsinki Declaration and study procedures were approved by the Universities' Research Ethics Committee (CER, Comité d'Éthique et de la Recherche). It was conducted online using Limesurvey, a secure web surveying platform, and targeted a general non-specific population. Inclusion criteria were Internet use and SM use, and being 18 years old. Facebook and Instagram use were assessed for the study. Therefore, it was mandatory to have an account of at least on one of those two SM platforms. Participation was voluntary and the survey link was posted on French Facebook groups and professional networks. Participants were informed of the research team's contact details, study aims, and study ethics (i.e. confidentiality, anonymity, secure surveying platform, and secured storage of data). Participants agreed to the informed consent to participate.

2.3. Measures

2.3.1. Socio-demographic information

First, participants completed an anamnestic sheet that collected sociodemographic characteristics (e.g. age, sex, socio-professional category) and internet use-related information (e.g. activities carried out on the Internet, its use for work, Instagram use for work, SM use). History of addictions was evaluated by the item “I have had addictive behaviors to certain products or behaviors in the past” (Yes/No).

2.3.2. Problematic Facebook use

A French translation of the Bergen Facebook Addiction Scale (BFAS, Andreassen et al., 2012) was used for measuring problematic Facebook use (PFU). Internal consistency on the original version of the BFAS was good $\alpha = .83$, which had a one-factor structure with good fit indicators (RMSEA=.046, CFI=.99). For this study, the BFAS was translated into French, back-translated by two bilingual researchers, and compared with French-versions of the BFAS that were provided on French addiction self-help sites. Another previous French study translated and back-translated the BFAS into French and found good internal consistency ($\alpha=0.81$) (Laconi, Verseillé, & Chabrol, 2018). This scale operates from the six-component model of addiction perspective (Griffiths, 2005), “You feel an urge to use Facebook more and more”, “You use Facebook so much that it has had a negative impact on your job/studies”. It is a 6-item self-report scale on a 5-point Likert scale (1=very rarely, 2=rarely, 3=sometimes, 4=often, 5=very often). The overall score ranged from 6 to 30, with higher scores reflecting a greater PFU. On our sample, the scale has good internal consistency $\alpha=.81$.

2.3.3. Problematic Instagram use

Problematic Instagram use (PIgU) was measured with an adaptation of the Bergen Facebook Addiction Scale to Instagram use (BFAS; Andreassen et al., 2012). Instagram is a

growing social network that does not yet have a validated tool allowing to measure its use. For this study, the French translation of the BFAS was used, as the items were identical apart from the term “Facebook” was replaced by “Instagram”. (“You use Instagram in order to forget about personal problems.”, “You become restless or troubled if you are prohibited from using Instagram.”). It is a self-report scale with 6 items listed on a 5-point Likert type scale (1=very rarely, 2=rarely, 3=sometimes 4=often, 5=very often). This measure was used as a continuous variable (scores ranging from 6 to 30, as the original rating was conserved), with higher scores indicating higher levels of PIgU. Internal consistency on our sample was good $\alpha=.84$.

2.3.4. Perfectionism

Perfectionism was measured with the Positive and Negative Perfectionism Scale created by Terry-Short, Owens, Slade, and Dewey (1995), translated and validated in Canadian French (EPPN; Seidah, Bouffard, & Vezeau, 2002). This scale assessed positive and negative perfectionism with 40 self-evaluating items, on a 7-point Likert-type scale (1=strongly agree, 2=mostly disagree, 3=somewhat disagree, 4=somewhat agree, 5=mostly agree, 6=strongly agree, 7=not applicable). The global scale had excellent internal consistency $\alpha=.91$, so did the positive perfectionism subscale ($\alpha=.82$), and the negative perfectionism subscale ($\alpha=.91$). For more precision, the scale was also divided into 4 other subscales: self-directed positive perfectionism ($\alpha=.78$) (“Producing a perfect performance is a reward in its own right.”, “When I’m competing against others, I’m motivated by wanting to be the best.”), socially prescribed positive perfectionism ($\alpha=.74$) (“I like to please other people by being successful.”, “I enjoy the glory gained by successes.”), self-directed negative perfectionism ($\alpha=.84$) (“No matter how well I do I never feel satisfied with my performance.”, “I would rather not start something than risk doing it less than perfectly.”), and socially

prescribed negative perfectionism ($\alpha=.85$) (“When I do things I feel others will judge critically the standard of my work.”, “I try to avoid the disapproval of others at all costs.”).

2.3.5. Metacognitions

The Metacognitions Questionnaire (MCQ; Cartwright-Hatton & Wells, 1997), was translated into a short French version by Larøi, Van der Linden, and d’Acremont (2009), validated by Dethier, Heeren, Bouvard, Baeyens, and Philippot (2017). It’s a self-administered questionnaire of 30 items on a Likert-type 4-point scale (1=disagree, 2=slightly agree, 3=somewhat agree, 4=completely agree). The global scale had good internal consistency $\alpha=.88$ and on its five individual subscales: positive beliefs about concern ($\alpha=.84$) (“Worrying helps me to get things sorted out in my mind.”, “Worrying helps me to avoid problems in the future.”), beliefs about uncontrollability of thoughts and danger ($\alpha=.84$) (“I could make myself sick with worrying.”, “My worrying is dangerous for me.”), cognitive confidence ($\alpha=.84$) (“I do not trust my memory.”, “I have little confidence in my memory for places.”), beliefs related to superstition, punishment and responsibility ($\alpha=.78$) (“If I did not control a worrying thought and then it happened, it would be my fault.”, “I will be punished for not controlling certain thoughts.”), and cognitive self-consciousness ($\alpha=.80$) (“I am constantly aware of my thinking.”, “I pay close attention to the way my mind works.”).

2.3.6. Online cognitions

The Online Cognition Scale (Davis et al., 2002) was translated into French and back-translated for this present study, to assess cognitive distortions linked to Internet use. It’s a 33-item self-report scale with 7-point Likert-type answers (1=totally disagree and 7=totally agree). The global scale showed good internal consistency $\alpha=.90$ and so did the subscales: social comfort ($\alpha=.83$) (“You can get to know a person better on the Internet than in person.”, “I wish my friends and family knew how people regard me online.”), loneliness and depression ($\alpha=.75$) (“I am less lonely when I am online.”, “The Internet is an important part of

my life.”), diminished impulse control ($\alpha=.77$) (“I often keep thinking about something I experienced online well after I have logged off.”, “When I am on the Internet, I often feel a kind of “rush” or emotional high.”), and the distraction that the Internet provides ($\alpha=.76$) (“When I am online I don’t think about my responsibilities.”, “I find that I go online more when I have something else I am supposed to do.”).

2.3.7. Social Media Burnout

Social Media Burnout (SMB) was assessed with the Social Media Burnout Scale originally developed in English (SMBS; Han, 2018; Ma & Liu, 2019). The version that was used was a 10-item self-report scale with 7-point Likert-type responses (1=totally disagree to 7=I totally agree). Three components characterizing SMB are measured in the scale, which are ambivalence (“I don’t know why I’m using Social media.”, “I don’t know if using Social media is worth my time.”), exhaustion (“I feel exhausted by using Social media.”, “I wasted too much time of Social media.”) and depersonalization (“Social media doesn’t matter to me.”, “If I could, I would stay away from Social media.”). Given there was no French translation of the SMBS, the English version of the scale presented in the Chinese translation study (Ma & Liu, 2019), was translated into French following the first three steps of the cross-cultural adaptation method (Beaton, Bombardier, Guillemin, & Ferraz, 2000). As such, the scale was translated into French by two French researchers, a back translation was done by a native English speaker, and researchers agreed on a final version that was used but not yet validated. Psychometric properties of the original English version were good ($\alpha=.91$, $\alpha=.91$, $\alpha=.83$, $\alpha=.84$) (SMBS; Han, 2018), and psychometric properties of the Chinese version were good (CFI = 0.976, TLI = 0.965, RMSEA = 0.067, SRMR = 0.043) (Ma & Liu, 2019). On our sample, the scale had good internal consistency with $\alpha=.79$.

2.4. Data analysis

Statistics were performed using Jamovi® software. Pearson's correlations were performed between study variables (**RQ**). Comparison of means (Student T-tests, Mann Whitney-U) were performed to evaluate differences in means in a student and non-student group in regards to PIgU, PFU, and SMB (**H2**). A multiple linear regression analysis was conducted to determine significant predictors of SMB (**H1 to H5**). The term "PSM variables" was used to refer to PFU and PIgU simultaneously when necessary.

3. Results

3.1. Descriptive results

Table 2 here below shows correlations between most study variables, means of study variables, and standard deviations.

Table 2

Means, Standard deviations and correlations of study variables (n = 825)

	1	2	3	4	5	6	7	8	9	10	11
1. PFU	-										
2. PIgU	0.01	-									
3. OCS	0.37***	0.29***	-								
4. SMBS	0.06	0.18***	0.09**	-							
5. MCQ 1	0.07*	0.08*	0.19***	0.03	-						
6. MCQ 2	0.15***	0.18***	0.25***	0.19***	0.23***	-					
7. MCQ 3	0.14***	-0.01	0.16***	-0.00	0.09**	0.20***	-				
8. MCQ 4	0.12***	0.17***	0.32***	0.12***	0.37***	0.53***	0.17***	-			
9. MCQ 5	0.01	0.09**	0.15***	0.05	0.37***	0.36***	0.05	0.47***	-		
10. PP	0.01	0.19***	0.20***	0.06	0.34***	0.15***	0.00	0.30***	0.27***	-	
11. NP	0.15***	0.16***	0.29***	0.19***	0.35***	0.53***	0.17***	0.55***	0.31***	0.45***	-
12. Age	0.20***	-0.33***	-0.16***	-0.20***	-0.10**	-0.10**	0.06	-0.09*	-0.10**	-0.20***	-0.11**
Mean	12.6	4.35	91.1	67.9	12.4	15.5	11.4	11.3	17.2	86.8	77.3
SD	5.83	5.46	28.8	14.5	3.35	4.85	4.71	4.18	4.16	14.5	20.9

Note. * p<.05, ** p<.01, *** p<.001, PFU: problematic Facebook use. PIgU: problematic Instagram use. OCS: Online Cognitions Scale.

SMBS: Social Media Burnout Scale. MCQ1: Positive beliefs about concern. MCQ2: Beliefs about uncontrollability of thoughts and danger.

MCQ3: Cognitive confidence. MCQ4: Beliefs related to superstition, punishment and responsibility. MCQ5: Cognitive self-consciousness. PP:

Positive Perfectionism. NP: Negative Perfectionism

Table 2 indicates that age was significantly and negatively correlated with most of the study variables, with the exception of PFU scores and the cognitive confidence metacognition subscale. Both PSM variables are positively correlated with online cognitions, and PIgU correlated positively with SMB scores. Only PIgU and PFU did not correlate significantly. In regards to metacognition subscales, PFU correlated positively with all of the metacognition subscales, except for cognitive self-consciousness, and PIgU scores correlated positively with all of the subscales, except for cognitive confidence. SMBS scores were significantly and positively correlated to beliefs about uncontrollability and thoughts of danger, and beliefs about to superstition, punishment and responsibility. Furthermore, the negative perfectionism subscale correlated positively and significantly with SMBS scores, and with both PSM variables. Positive perfectionism was positively correlated with PIgU scores, and online cognition scores.

3.2. Comparison of means

Comparison of means were performed to evaluate differences in means of students and non-students in regards to PIgU, PFU, and SMB. It was found that PIgU scores were higher in the student group ($M=5.70$, $SD=5.78$), than the non-student group ($M=2.87$, $SD=4.68$), $U(N_{Students}=431, N_{Non-students}=394)=57517$, $p<.001$. To the contrary, the non-student group scored higher for PFU ($M=13.6$, $SD=5.65$) than the student group ($M=11.6$, $SD=5.86$), $t(2, 823)=-4.85$, $p<.001$. At last, the student group reported higher SMBS scores ($M=36.8$, $SD=10.9$) than the non-student group ($M=33.3$, $SD=11.5$), $t(2, 823)=4.56$, $p<.001$.

3.3. Multiple regression analysis

Table 4 indicates the results of multiple linear regression analysis that was performed to identify predictors of SMB.

Table 4

Standardized and unstandardized coefficients on Social media burnout

Scales	Study variables	Social Media Burnout				
		β	b	SE	t	p
	Intercept		32.09	5.29	6.06	<.001
	Age	-0.11	-0.10	0.04	-2.53	<.05
	Sex: Male - Female	0.05	0.61	1.02	0.60	0.54
	Student: Non-student - Student	-0.04	-0.47	0.94	-0.50	0.61
	History of addictions: Yes - No	0.10	1.19	0.80	1.48	0.13
	Internet for work: Yes - No	-0.19	-2.20	0.90	-2.44	<.05
	Instagram for work: Yes - No	-0.27	-3.10	1.16	-2.66	<.01
	Instagram profile : Yes - No	-0.05	-0.59	0.93	-0.64	0.52
	Facebook profile : Yes - No	-0.09	-1.10	4.17	-0.26	0.79
MCQ	Positive beliefs	-0.03	-0.07	0.09	-0.84	0.39
	Uncontrollability of thoughts and danger	0.10	0.25	0.09	2.62	<.01
	Cognitive Confidence	-0.04	-0.11	0.07	-1.49	0.13
	Superstition, punishment, responsibility	-0.02	-0.05	0.11	-0.46	0.64
	Cognitive self-consciousness	-0.01	-0.04	0.10	-0.46	0.64
EPPN	Self-oriented positive perfectionism	0.07	0.10	0.06	1.72	0.08
	Socially prescribed positive perfectionism	-0.08	-0.11	0.05	-1.99	<0.05
	Self-oriented negative perfectionism	0.11	0.12	0.05	2.13	<.05
	Socially prescribed negative perfectionism	0.02	0.02	0.04	0.52	0.59
PSM	Problematic Instagram use	0.10	0.22	0.08	2.67	<.05
	Problematic Facebook use	0.04	0.08	0.06	1.25	0.20
OCS	Social comfort	-0.29	-0.30	0.04	-7.43	<.001
	Loneliness and depression	-0.14	-0.22	0.07	-3.16	<.01
	Deficit of impulse control	0.24	0.29	0.05	5.05	<.001
	Distraction	0.19	0.27	0.05	4.87	<.001
	Explained variance (R^2)				0.24	

Note. MCQ: Metacognitions Questionnaire, EPPN: Positive and Negative Perfectionism Scale, PSM: Problematic Social Media measures, OCS: Online Cognition Scale

The multiple linear regression analysis, presented in Table 4, was conducted to observe the impact of socio-demographic information, metacognitions, perfectionism, PIgU and PFU, and online cognitions on SMB. A significant model was observed, $F(23,791)=11.6$, $p<.001$, and explained 24% of the variance. Age, and not using the internet for work are

negative predictors of SMB, meaning that younger age was more likely to predict SMB, and using the Internet for work would predict SMB. In addition, having a history of past addictions is a significant positive predictor of SMB. It appears that beliefs about uncontrollability of thoughts and danger, socially prescribed positive perfectionism, self-oriented negative perfectionism, PIgU, online cognitions about deficit of impulse control, and online cognitions about distraction are significant positive predictors of SMB, and online cognitions about social comfort and online cognitions about loneliness and depression are significant negative predictors.

4. Discussion

The aims of the study were to investigate relations between PSM variables, perfectionism, metacognitions, online cognitions, and SMB, and measure the impact of variables on SMB. **(H1)** It was found that only PIgU and online cognition subscales impacted SMB. **(H2)** Students scored higher for PIgU and SMB scores in comparison to non-students, and age was negatively associated with PIgu and positively to PFU, online cognitions, and SMB. **(H3)** Socially prescribed positive perfectionism and self-oriented negative perfectionism impacted SMB. PIgU was associated to positive and negative perfectionism, and PFU only to negative perfectionism. **(H4)** Positive perfectionism was positively associated to all metacognitive dimensions except for cognitive confidence, and negative perfectionism was positively associated to all metacognitive dimensions. **(H5)** Both PIgU and PFU were positively associated to “positive beliefs about concern”, “beliefs about uncontrollability of thoughts and danger”, and “beliefs related to superstition, punishment, and responsibility”. PIgU was also positively associated to “cognitive confidence”, and PFU to “cognitive self-consciousness”. SMB was positively associated with “beliefs related to superstition, punishment and responsibility” and “uncontrollability of thoughts and danger”, but only “uncontrollability of thoughts and danger” significantly impacted SMB.

4.1. PSM variables and Age

Results underlined differences when it comes to PSM platforms and SMB, as PFU and PIgU weren't correlated, and only PIgU impacted SMB. The independence between PFU and PIgU might be related to specificity of each of the platforms, as this was suggested in literature (Pantic, 2014; Ryan et al., 2014; van de Eijnden et al., 2016; Kuss & Griffiths, 2017). Indeed, there may be differences in regards to platforms' purposes, as Facebook was identified more for keeping up with friends or brands, Instagram for capturing and sharing everyday life moments through pictures and videos, and Twitter for sharing ideas and information (Sanz-Blas et al., 2019). This may encourage further studies to investigate SM applications independently in regards to SMB, since "social media" is an umbrella term for multiple online activities (Aydın et al., 2020). Nevertheless, it is essential to account for the connection of profiles that is allowed between SM platforms, such as Tinder (considered a social networking site) with Facebook (Orosz et al., 2016; Strubel & Petrie, 2017).

Age might also be implicated in independency of PSM variables, given that, on our sample, age was negatively associated to PIgU and positively associated to PFU, meaning that younger users presented greater PIgU and older individuals presented greater PFU. It was shown that younger users have different SM habits than adults (Jang, Han, Shih, & Lee, 2015), which makes sense since they were immersed in a world full of technology, but this might also make them more vulnerable to develop Internet-related disorders (Grau, et al., 2019). It may be suggested that young individuals might prefer more recent types of SM such as Instagram.

4.2. PSM, Age, and SMB

In accordance to previous literature (Grau et al., 2019; Gupta, 2019; Shi et al., 2020), age was a negative predictor of SMB, meaning that younger individuals might be more prone to develop SMB. Following the hypothesis that young individuals prefer more recent

platforms and new applications (which implies getting to know new features and adapting to a new way of communication), this might enhance system overload (Maier et al., 2015), higher privacy concern, and less SM confidence (Bright et al., 2015; Zhang et al., 2021), which were predictors of SMB.

Although this present study hypothesized that both PSM variables would impact SMB, only PIgU was found to be a positive predictor of SMB. What characterizes Instagram is that its communication mode is focused on sharing photos and videos with the possibility of applying filters (Hu, Manikonda, & Kambhampati, 2014). Instagram's success is mostly based on instant popularity and adherence gained by "following" or "being followed" (Casaló, Flavián, Ibáñez-Sánchez, 2018), and this platform can be used in a strategic matter for influencing and marketing (Manovich, 2016; Pilgrim & Bohnet-Joschko, 2019). For users, this may be like a modern life guide which reflects ideas about health, happiness, lifestyles, fashion, appearance, and more. Not only may this favor social comparison (Cramer et al., 2016), it also may create conflict in regards to meaning in life which was positively associated to PIU (Aydin, 2017; Blau, Goldberg, & Benolol, 2019), suggesting that a lack of meaning may encourage excessive use of Internet (Ghaderi Rammazi, Askarizadeh, Ahmadi, & Divsalar, 2018; Laudet, Morgen, & White, 2006; Laudet, Savage, & Mahmood, 2002). Therefore, the effort to stay "in trend" may be connected to deeper inner conflicts, and contribute in explaining the relationship between PIgU and SMB. Results of this study should be interpreted with precaution and relativized given that variances and mean scores for PIgU were relatively low. However, these results open perspectives for replicating this study, comparing individuals with confirmed PIgU to a non-PIgU group.

4.3. PSM variables, perfectionism, and SMB

PSM variables were associated to perfectionism, as PIgU was positively associated to both negative and positive perfectionism, and PFU was only associated to negative

perfectionism. Although our results solely indicated a significant association between SM platforms and perfectionism (and not the underlying mechanisms), results are in line with previous literature which suggested that technology use increased intolerance to imperfection (Fatah, 2017; Sedera & Lokuge, 2020), and indicated that SM platforms favor self-comparison on multiple levels (e.g. health, appearance, parenting) which was predicted by perfectionism (Cramer et al., 2016; Latif et al., 2020; McComb, & Mills, 2021; Padoa et al., 2018; Yang & Stoeber, 2012).

Results of this study indicated that socially prescribed positive perfectionism and self-oriented negative perfectionism significantly impacted SMB, supporting our second hypothesis. Previous literature indicated that perfectionism was associated to emotional exhaustion, stress, and occupational burnout (Chang & Lee, 2020; Chang et al., 2020; Hill & Curran, 2015; Kanten & Yesiltas, 2015; Luo et al., 2016; Robakowska et al., 2018), and the relationship of perfectionism with social comparison, and social comparison with SM. It may be suggested that efforts put in controlling one's image on SM is what may contribute to social overload (Maier et al., 2015). More precisely, for self-oriented negative perfectionism, it can be hypothesized that exposure to other individual's posts might enhance social comparison which might positively reinforce negative thoughts towards oneself. For socially prescribed positive perfectionism's implication in SMB, it can be hypothesized that receiving positive comments on pictures (that may be modified by filters, or staged) might positively reinforce the individual's desire to live up to a created and embellished image online (Griffiths & Balakrishan, 2018; Sedera & Lokuge, 2020), in real life. Posting on Instagram, especially when self-promoting, was shown to negatively impact both the individual posting and the viewer (de Vries et al. 2018; Fox, Vendemia, Smith, & Brehm, 2021; Hellman, 2016; Vendemia & DeAndrea, 2018). We hypothesize that individuals' efforts to live up to a created online image may create cognitive dissonance, a feeling of mental discomfort stemming from

awareness of inconsistencies between attitudes, behaviors and beliefs that can be reduced by attempts to rationalize these behaviors and beliefs (Festinger, 1957).

4.4. Metacognitions and PSM variables

PIgU was associated to all metacognition dimensions apart from the cognitive confidence subscale, and PFU was associated to activation of all dimensions of metacognitions except for the cognitive self-consciousness subscale.

Previous studies showed the association between metacognitions and PFU (Marino, Marci, Ferrante, et al., 2019; Marino, Vieno, Moss, et al., 2016). More specifically, two of the five metacognition dimensions (negative beliefs about thoughts and cognitive confidence) predicted PFU (Marino, Vieno, Moss, et al., 2016). What might contribute to differences between our results and previous studies, is the choice in measurements for PFU and PIgU. Indeed, for measuring PFU and PIgU, our study used the BFAS for PFU (Andreassen et al., 2012), and an adaptation of the BFAS to Instagram for measuring PIgU, whereas other previous studies (Marino, Marci, Ferrante, et al., 2019, Marino, Vieno, Moss, et al., 2016), used the Problematic Facebook use Scale (PFUS; Marino, Vieno, Altoè, & Spada, 2017). In addition, this present study measured the association between PIgU and PFU with metacognitions, and not the impact of metacognitions on PIgU and PFU, as the main focus of this study was to explore the impact of metacognitions on SMB. In addition, although the relationship between PIgU and metacognitions was not studied before (to our knowledge), its association with four out of five metacognition dimensions tends to support previous evidence of the involvement of metacognitions and problematic online behaviors, and that maladaptive thinking styles may be involved in worsening the levels of PSM (Marino, Marci, Ferrante, et al., 2019, p. 72).

Originally, what motivated studies on the relationship between metacognitions and PSM, were previous results which showed that all metacognition dimensions correlated with

PIU and that negative emotions predicted metacognitions which in turn predicted PIU (Spada, Langston, Nikčević, & Moneta, 2008). It was postulated that online platforms may be used as cognitive and affective self-regulation strategies in regards to negative outcomes of activation of metacognitive beliefs (Akbari, 2017; Marino, Marci, Ferrante, et al., 2019; Spada, Langston, Nikčević, & Moneta, 2008). In this perspective, it may be hypothesized that metacognitions influence consumer intentions, as different kinds of metacognitive beliefs are activated in different contexts and that each platform will allow to cope with specific difficulties. For example, “positive beliefs about concern” (e.g. worrying helps avoid, solve, and adapt better to problems, remain organized, and work better) and “cognitive self-consciousness” (e.g. being aware of cognitive processes, thoughts, monitoring thought), individuals might engage more into activities such as online browsing, fact checking, following study or work-related information, and following a greater number of profiles. For “beliefs related to superstition, punishment, and responsibility” (e.g. not being to control thoughts would not be good and be a sign of weakness, and may be punished), and “beliefs about uncontrollability of thoughts and danger” (e.g. worry could be dangerous, lead to being craziness or provoke illness, worry couldn’t be ignored and couldn’t be stopped) that were positively associated to both PIgU and PFU, individuals might engage into online behaviors that provide comfort and reassurance (e.g. control of self-presentation, control reactions to posts, delete unfavorable comments, follow self-help posts), given that online behaviors were previously shown to allow avoidance of reality and provide shelter (Aydin, 2017; Bilgin, Şahin, & Togay, 2020). What may explain the non-involvement of PIgU with “cognitive confidence” (in one’s own attention and memory), compared to previous results that showed that these beliefs were related to PIU (Spada Langston, Nikčević, & Moneta, 2008), might be the fact that Instagram continuously updates management features (Casalo, Flavián, & Ibáñez-Sánchez, 2017), and despite the practical layout and internal storage of Instagram (e.g.

pictures, videos, conversations), individuals may rely more on other features provided by Facebook, the Internet in general, and other applications (e.g. GPS, notes, agenda, contacts, mail, conversations, groups).

4.4. Metacognitions, online cognitions, and SMB

This present study evaluated the impact of metacognitions and online cognitions on SMB. Only the subscale “beliefs about uncontrollability and thoughts of danger” was a positive predictor of SMB, which involves cognitions about worry. SMB was also positively associated with “beliefs related to superstition, punishment, and responsibility”, which corresponds to a strong sense of responsibility towards the control of thoughts and fear of punishment if the control is unsuccessful.

In regards to the impact of metacognitive beliefs about uncontrollability and thoughts of danger on SMB, involvement of these metacognitive beliefs were previously shown with problematic online gaming, however, the study that measured this had adapted the scale so that metacognitions would be about online gaming (“thoughts about gaming interfere with my functioning”) (Caselli, Marino, & Spada, 2020; Spada & Caselli, 2017), whereas this present study investigated general metacognitions (“If I could not control my thoughts, I would not be able to function”) (Cartwright-Hatton, & Wells, 1997). This is an important bias in comparing results with this particular study. In addition, another previous study showed that search for control, and worry about personal Internet were related to various forms of SM fatigue (Dhir et al., 2019). This relates both to the impact of “beliefs about uncontrollability and thoughts of danger” on SMB, and the positive association between “beliefs related to superstition, punishment, and responsibility” with SMB. It may be argued that SM could be perceived by the individual as a compatible way to cope with beliefs about worry, which in turn contributes to the overwhelming factor of SMB (Han, 2018). As such, this type of metacognition could possibly be as a stressor or in relation to other potential stressors such as information

overload, social overload, system overload, privacy concerns, privacy invasion, and fear of missing out (Xiao & Mou, 2019), which would need to be determined in further studies that could test the association of all of those variables. Indeed, we previously suggested that activation of these beliefs was likely to motivate a search for relief on online platforms, in terms of maladaptive compensation (Aydin, 2017). It seems essential to investigate how maladaptive compensation to this type of metacognitive beliefs would translate in terms of online behaviors, in order to get a better look on the potential types of overload and other mechanisms that may be involved.

This present study evaluated online cognitions with SMB. In our study, it was found that SMB was predicted by all of the online cognition subscales. A previous study evaluated escapism and controllability with the same measurement (OCS), and designated items as positive metacognitive beliefs, and found that activation of these beliefs mediated the relationship between emotional dysregulation and PIU (Casale, Caplan, & Fioravanti, 2016). What might contribute to conflicting interpretations in literature is the fact that the terms “cognitions” and “metacognitions” were sometimes used interchangeably. Indeed, items of the OCS were presented as “online metacognitions” (Casale, Caplan, & Fioravanti, 2016), although they were originally presented as “online cognitions” (Davis et al., 2002). Despite intricate terminology (online cognitions and online metacognitions), some of the results from this present study still resonated with that particular research. As such, SMB was positively predicted by the “deficit of impulse control” subscale and the “distraction” subscale, and was negatively predicted by the “social comfort” subscale and “loneliness and depression” subscale. In other words, the more an individual perceived themselves as having trouble abstaining from using the Internet and the more they acknowledged the fact that Internet would allow distraction from complicated real-life situations, the more they were inclined to feel burnt out from SM. This relates with ambivalence in SMB (ambiguity between favorable

and negative outcomes) (Han, 2018), and might also trigger emotional responses over overload defined in SMB (e.g. feeling exhausted, anxious, irritated, tired, bored) (Zhang et al., 2021). In addition, being more comfortable with online interactions than offline interactions, thinking that online interactions allow to be less lonely, and attributing importance to Internet in one's life, may prevent from showing signs of SMB. This makes sense, as this perception of online behaviors implies a caring and positive approach of Internet use, which seem to fulfill a social function. In SMB, exhaustion corresponds to the acknowledgment that Internet use would be resource consuming (Han, 2018), and Internet would be potentially perceived as impractical. Accordingly, literature also showed that believing that Internet leads to gratification, reinforced development of excessive Internet use (Brand et al., 2016; Chou & Lee, 2017; Lee, Ko, & Chou, 2015; Wang, Wu, & Lau, 2016; Wu, Ko, Wong, Wu, & Oei, 2016).

4.5.Limitations

Despite having a significant number of participants that were fairly diversified in age, only 15% of the sample were male participants. However, there was approximately the same number of students and non-students, which allowed us to at least compare those two groups. Furthermore, some of the scales were adapted for the study. First of all, the measure for PIgU was done with the Bergen Facebook Addiction Scale, as there was no specific measure in French language to assess this. Results should be interpreted cautiously, as adapting a measure is a complex procedure, even though internal consistency was good. Previous studies that focused on PIgU also used adaptations of questionnaires created to measure PFU by replacing "Facebook" with "Instagram", which showed good internal consistency ($\alpha=0.79$) (Martinez-Pecino & Garcia-Gavilán, 2019), or adaptations of PSM measures by replacing "social media" with "Instagram" which also showed good internal consistency ($\alpha=0.89$) and good fit indices ($\chi^2/df = 3.38$, RMSEA = .08 (CI 90% [.06, .10]), SRMR = .02, CFI = .97,

GFI = .95) (Balta, Emirtekin, Kircaburun, & Griffiths, 2020; Kircaburun, & Griffiths, 2019). Further studies should focus on constructing a unique measuring scale for PIgU, as PSM platforms have unique and different features (Kircaburun, & Griffiths, 2019). Further studies could also use general scales designed for PSM such as the Bergen Social Media Scale (BSMAS; Andreassen et al., 2016), bearing in mind that the BSMAS is also an adaptation of the BFAS (Andreassen et al., 2012). This also accounts for existing measures for SM fatigue (or SMB), as it was argued that scales were often created or adapted in accordance to specific study purposes (Zhang et al., 2021). For this study, the SMBS and the OCS were used (Davis et al., 2002; Han, 2016; Ma & Liu, 2019), and were translated into French. Although these scales were not yet validated, which is a limit of this present study, internal consistencies were good for each scale. Literature would benefit from having a French translated and validated version of the SMBS, to compare results on SMB from various countries.

4.6. Implications and research perspectives

This study provides a better understanding of the relationship of SMB, PIgU, PFU, online cognitions, and metacognitive beliefs.

An interesting finding is that PIgU and PFU are not involved in the same way with SMB, as only PIgU had a significant impact on SMB. This implies that further studies on PIgU and SMB could further investigate underlying mechanisms in this relationship, and it would be interesting to study other popular SM applications (e.g. Snapchat, TikTok) and explore whether certain types of SNS such as online dating platforms are related to SMB. It was suggested that studying different types of SM platforms was more relevant given that their implications often vary (Malik, Dhir, Kaur, & Johri, 2020). The nature of the relationship between PSM and SMB remains unclear, and there is no consensus in regards of the definitions of both PSM and SMB. The main difference between SM addiction and SMB seems to be the eagerness and ability to step away from SM (Han, 2018; Liu & Ma, 2018),

and it is difficult to discern whether the relationship between PSM and SMB is a causal relationship or coexistence, taking in consideration that PIU is often associated to other psychiatric comorbidities (Carli et al., 2013). It may be hypothesized, that diverse clinical signs of PIgU (Griffiths, 2005), and the subjective relationships maintained with Instagram (individuals might give more importance to what goes on the platform in case of problematic use) could hinder reduction of SM use, which would favor exhaustion. Investigating PSM and SMB together in further studies may contribute to their understanding. Also, PSM was broadly studied these past decades, and the fact that these variables are related should encourage researchers to investigate relationships of variables with SMB that were significant with PSM.

Recent literature also suggested that PSM use plays a role in occupational/job burnout (e.g. choice of vocabulary in SM and posts might change in regards to these types of burnout) (Wu, Ma, Wang, & Wang, 2021; Han, Xu, Ge, & Qin, 2020). What could help clarify the relationship between PSM and SMB, and also verify whether SMB overlaps with offline burnout, taking in account this recent finding, further research could be led on the relationships between several PSM platforms and SMB, while comparing groups of individuals with occupational burnout, PSM, and SMB and control groups without burnout, PSM, and SMB.

This present study identified that age was a potential negative predictor of SMB. In further studies, it might be interesting to compare different age groups, and study generational aspects along with SMB. Also, we support the advice that educational institutions should organize counseling interventions to address misuses and risks of SM (Malik et al., 2020). Indeed, it is essential to consider development of preventative interventions among adolescent individuals and young adults, or integrating information about the risks of SMB into preexisting interventions for PIU, which already focus more on management of Internet use

rather than elimination of Internet use, and contain a great part of psychoeducation and skill development interventions that might also be relevant for SMB (Szász-Janocha, Vonderlin, & Lindenberg, 2021; Young, 2013). We also hypothesize that in a therapeutic setting, it may be easier to express oneself about characteristics of SMB rather than PSM, which may withhold a more negative connotation. Therefore, developing therapeutic tools to facilitate communication around this topic, and using concrete guidelines and advice in the perspective of behavioral activation, could benefit patients since this may have an empowering role when applied. Former studies suggested that meditation training and mindfulness-based interventions could be beneficial to treating PSM (Sriwilai & Charoensukmongkol, 2016), and it seems that this could also be an interesting perspective for SMB. Indeed, such an approach may help individuals put their SM use in a more global perspective and also learn new types of self-regulation skills.

As expected (H4), metacognitions and perfectionism positively correlated and were found to be associated with SMB. Previous literature showed that these components were both associated with other psychological disorders (Fakhri et al., 2020; Grøtte et al., 2015; Kannis-Dymand et al., 2020). This association would need to be confirmed in further studies, to figure out the nature of this relationship.

In addition, as it appears that perfectionism is related to PIgU, PFU, SMB, and the concept of digital perfectionism being recently introduced into literature (Sedera & Lokuge, 2020), further research should be led on specific SM related perfectionism. More precisely, identifying sources of digital perfectionism, and its cognitive, emotional, and behavioral implications. The implication of perfectionism in SMB might be an important factor to consider when creating potential preventative or curative therapeutic interventions, but needs to be studied further. Indeed, as this present study focused on trait perfectionism, further studies on the relation between perfectionism and SMB should include a measure of

interpersonal perfectionism. Interpersonal perfectionism corresponds to the public expression of perfectionism through perfectionistic self-promotion, non-disclosure of imperfections, and non-display of imperfections (Casale, Fioravanti, Rugai, Flett, & Hewitt, 2016, p. 320), which can be measured with the Perfectionistic Self-Presentation Scale (PSPS) which was also adapted and validated among an adolescent population (PSPS-Jr) (Hewitt, Flett, Sherry, et al., 2003; Hewitt, Blasberg, Flett, et al., 2011), allowing to also perform studies on younger populations. Previous studies on the relation between perfectionistic self-presentation and SM were shown to be related to stress and anxiety, and there was a significant association between non-display of imperfection, SM, depression, stress, and anxiety (Hellman, 2016). We suggest it may also be pertinent to include the Perfectionistic Presentation Hiding Effort Scale (PSP-HES) which measured “the ability to portray an image of perfection while making it appear effortless” (Flett, Nepon, Hewitt, Molnar, & Zhao, 2016, p. 6), as SM makes it even easier to maintain control over self-presentation. Further studies should also investigate the role of persistence and perseverance mechanisms (that belong to perfectionism) in regards to SMB, as this might contribute to understand the relationship between perfectionism and SMB. Persistence was defined as ability to maintain behaviors in attempt to reach a goal despite the difficulty of this task, and perseverance the tendency of continuing a behavior or thought even when this ceases to be effective or rewarding (Serpell, Waller, Fearon, & Meyer, 2009).

At last, in regards to metacognitions and cognitions, there is a need to clarify the terms and measurements. Indeed, as specific measurements were created for metacognitions about online behaviors in regards to problematic online gaming (Caselli et al., 2020; Spada & Caselli, 2017), that the relationship between metacognitions dimensions (Cartwright-Hatton, & Wells, 1997) and online behaviors was demonstrated multiple times (Marino, Marci, Ferrante, et al., 2019; Marino, Vieno, Moss, et al., 2016 ; Spada, Langston, Nikčević, & Moneta, 2008), and that studies attempted to measure metacognitions about online behaviors

in regards to PSM using the online cognitions scale (Casale, Caplan, & Fioravanti, 2016), this seems to be an essential research perspective. Indeed, there is a need for creating a specific measurement tool for metacognitions about SM behaviors.

It may be interesting to continue to explore the cognitive, behavioral, and emotional aspects of SMB, as research on this conceptualization is still in its infancy (Zhang et al., 2021), and there is a use for studying behavioral outcomes and consequences of SMB (Malik et al., 2020).

Conclusion

This present study evaluated the relationship between PSM, perfectionism, metacognitions, online cognitions, and SMB, and indicated some potential new predictors of SMB. Findings mostly implicate new research perspectives, as SMB is still a relatively new topic. Perfectionism, the potential self-regulating role of SM, the association between PSM and SMB, and further methodological biases were highlighted. Further studies will be necessary on this topic, starting with the validation of a French translation (and other languages) of a measurement of social media burnout scale, knowing that research is relatively recent of which a decent amount of studies comes from Asian literature. In order to generalize results, cultural aspects of online behaviors should be taken in account, for instance, by implicating beliefs about Internet use.

Competing Interests

No competing Interests

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