Employee use of public social media: Theories, constructs and conceptual frameworks

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Abstract Public-facing social media platforms, such as Facebook and WeChat, are increasingly being embedded into corporate processes and routines. The use of public social media by employees has aroused widespread interest among scholars in recent years. This study summarizes published theories and models and proposes a causal-chain framework for research exploration into employee usage of public social media platforms by systematically analyzing the antecedent variables, mediators, moderators, and outcome variables used in 59 quantitative papers. The representative theories include: Social Capital Theory, Job Demands-Resources Model, Boundary Theory, Media Synchronicity Theory, Social Cognitive Theory, Technology Acceptance Model, Self-Determination Theory, and Media Richness Theory. Historically, researchers have studied social media usage behaviors as antecedents, rather than social factors, with many focusing on outcome variables such as job performance and job satisfaction, while the impact of employee social media usage on physical and mental health is less studied. In terms of moderators, variables such as use behavior, user characteristics and job characteristics receive most attention. With regards to mediators, social capital, job satisfaction, and work conflict are most significant. This study proposes future research directions for this field, including topics relating to platform attributes, social power, organizational culture, and employee health. The value of this research lies in the systematic refinement of the theoretical basis and the proposed causal-chain framework which is beneficial for revealing specific mechanisms for employee use of public social media platforms, and for stimulating new ideas for empirical research.

Keywords: Public Social Media, Social Media Impact, Communication Behavior, Employee Collaboration, Organizational Communication.

1. Introduction

Social media has become an indispensable part of our personal and professional lives, profoundly changing the way we interact with other humans and content. By 2021, it is envisaged that a third of the world's population will be active social media users, spending on average 135 minutes per day using internet-enabled platforms (Statista, 2018). Social media platforms, such as Facebook, LinkedIn and WeChat, are increasingly being embedded into organizational activities, leading to changes in employee communication and collaboration and also refinements in business models, organizational structures, processes, and daily work routines (van Zoonen, Verhoeven, & Vliegenthart, 2016). At the same time, social media has demonstrated improvements in efficiency of organizational communication, knowledge sharing and team collaboration, enhancing employee autonomy and performance (van Zoonen et al., 2016; van Zoonen & Rice, 2017). However, it has also demonstrated negative effects, such as challenging the boundary management capabilities of employees, creating added work pressures, increased work-life conflicts, and a reduction in employee well-being through e.g. excessive usage and technology dependency (Moqbel & Kock, 2018; van Zoonen, Verhoeven, & Vliegenthart, 2017; Yu, Cao, Liu, & Wang, 2018). Therefore, individuals and organizations must be well-prepared to embrace the challenges and opportunities brought about by social media engagement (Ngai, Tao, & Moon, 2015).

From the perspective of organizational behavior research, social media can be divided into two categories: enterprise social media and public social media (van Zoonen et al., 2017). Enterprise social media involves "web-based platforms that allow workers to: (1) communicate private messages with coworkers or broadcast messages to everyone in the organization; (2) explicitly indicate or implicitly instruct particular coworkers as communication partners; (3) post, edit, and sort texts and files linked to themselves or others; and (4) view the messages, connections, texts, and files which are communicated, posted, edited and sorted by anyone else in the organization at any time of their choice" (Leonardi, Huysman, & Steinfield, 2013, p.2). Public social media is developed and managed by commercial providers (e.g., Facebook and Twitter) and is often provided free-of-charge (Moqbel, Nevo, & Kock, 2013).

This study focuses on public social media rather than enterprise social media for

several reasons: (1) unlike enterprise social media which is strictly limited to organizational employees, all people can use public social media; this means that public social media can easily bridge the gap between our personal and professional lives. The use of public social media does not only enable employees to communicate and connect with family members and handle family affairs at work, but also enables employees to receive and complete work assignments after work, in the evening or at weekends (Moqbel, et al., 2013). The boundaries between work and life thus become blurred due to employees' use of public social media, but it is still unclear how this will affect both the work and personal environment. On a practical level, the use of public social media in the workplace has been received with a degree of skepticism, especially whether their usage actually brings benefits or potential loss, unlike that of their private counterparts (Moqbel et al., 2013); (2) in recent years, public social media has experienced exponential growth and may now be considered ubiquitous, available anywhere and at any time. Scholars have increased interest in public social media research. Existing studies have investigated the different aspects of employee use of public social media platforms and the various outcomes achieved, developing research themes which are diverse and broad; and (3) studies already exist that systematically review enterprise social media usage (Veeravalli & Vijayalakshmi, 2019; Wehner, Ritter, & Leist, 2017).

Considering the various forms and functions of social media, it is believed that further research will occur, focusing on the usage of public social media by employees. It is necessary to systematically identify and analyze related literature, including the theoretical basis, research focus, antecedents and outcome variables, moderators and mediators. Ultimately, this will assist in creating a clear causal-chain framework, which may provide new ideas and breakthroughs for future studies. At the time of writing, there is only one currently published literature review related to employees' use of social media, written by El Ouirdi, El Ouirdi, Segers & Henderickx (2015). The exploratory study of El Ouirdi et al.(2015) has the following limitations: (1) in terms of research samples collected, it does not include related research published after 2015, with studies relating to employees' use of social media, especially employee use of public social media, growing rapidly in recent years; (2) in terms of research objects,

employees' use of enterprise and public social media are combined, and the differences between the two are not considered, which leads to the limitation of instructive significance; (3) in terms of the research process, the study focuses on research topics and methods, failing to examine the theoretical basis, and the causal-chain framework.

This study will answer the following questions: (1) What are the main theories reported on in current research related to the use of public social media by employees? (2) Do the antecedents, mediators and moderators used in relevant studies focus on social factors, user attributes and organizational attributes respectively? (3) What are the characteristics of the outcome variables? and (4) What are the intended directions of future studies? The value of this research lies in the systematic refinement of the theoretical basis and the causal-chain framework which is beneficial for revealing the specific mechanisms of employee use of public social media and stimulating new areas for future empirical research. In turn, this may help promote the rapid growth of knowledge and expertise in this field.

This study begins with a brief description of the research methods, including the collection, selection and identification of research data. Then, it summarizes the theoretical basis, the antecedents, the mediators, the moderators and the outcome variables of existing research, building a causal-chain framework of public social media usage by employees. Secondly, this paper analyzes the results of the causal-chain framework and systematically discusses future research directions. Finally, in the conclusion, contributions and limitations are summarized.

2. Method

Referring to the associated literature review presented by El Ouirdi et al. (2015), this section introduces three dimensions, namely data range, data selection and data description.

2.1 Scope of the data collected

The scope of the data is primarily defined by forms, content and databases. In relation to forms, this study focuses solely on academic journal articles, while book chapters, conference papers and other non-academic journal articles are excluded. The publication of academic papers usually requires critical review by peer experts,

ensuring that the information contained in the publication is certified (El Ouirdi et al., 2015). Nagi et al. (2015) also confirmed that peer-reviewed articles are more representative. In terms of content, this study examines employee usage behaviors on public social media platforms, with papers focusing on how employees use enterprise social media, with its impact being not included. In addition, papers related to organizational use of social media and its impacts are also not included. More importantly, those articles not using empirical research methods and explicitly mentioning the antecedents and outcome variables were excluded. As for databases, this study focuses on papers indexed in the Web of Science (core collection) database, which contains more than 12,400 authoritative and high-impact journal articles, fully reflecting representative research on employee use of public social media.

2.2 Data Selection

To identify relevant data, this study applied the keywords used by El Ouirdi et al. (2015) and Nagi et al. (2015), searching the Web of Science database for combinations of the following: "social media", "Facebook", "Twitter", "social networking site", "blog", "web 2.0", "employee" and "workplace". Data retrieval was conducted simultaneously by two Research Assistants (RAs) from 15th to 20th January 2019. After the initial round of preliminary searches, 435 articles were selected. Subsequently, the RAs manually identified papers that studied the behaviors and impact of employees' use of enterprise social media by browsing abstracts based on data selection criteria, identifying those that studied employee use of public social media, but not explicitly mentioning antecedents and outcome variables. Accordingly, 66 papers were obtained. Finally, the RAs carefully examined the methodologies adopted in each article and excluded those that mentioned the research object as enterprise social media, thus narrowing the sample to 53 papers identified. In addition, considering the time lag of papers in the Web of Science database, two RAs examined the citations of the 53 papers to find those that had been published online, but not yet been assigned an issue number, resulting in 59 papers being obtained in total.

2.3 Data Description

From the 59 papers obtained, they were mainly published in the following

academic journals: *Computers in Human Behavior* (N=12), *International Journal of Information Management* (N=4), *Information Technology & People* (N=3), *Behaviour & Information Technology* (N=2), *Information & Management* (N=2), *International Journal of Hospitality Management* (N=2), *Journal of Business Research* (N=2), *Journal of Computer-Mediated Communication* (N=2), *Social Science Computer Review* (N=2), *Public Relations Review* (N=2), etc. In terms of publication date, one article was published in 2020, five in 2019, thirteen in 2018, nine in 2017, eight in 2016, four in 2015, nine in 2014, five in 2013, two in 2011, one in 2009, and two were in-press, awaiting issue number. In terms of authors, van Zoonen Ward (Netherlands), Cao Xiongfei (Mainland China), Charoensukmongkol Peerayuth (Thailand) and Moqbel Murad (USA) were all representative authors, publishing six, five, three and two articles, respectively.

3. Results

This section presents the findings identified from the narrative review of 59 studies which investigated the usage behaviors of employees on public social media platforms, including theoretical foundations, variables (antecedents, mediators, moderators, and outcomes) adopted, and the potential causal-chain framework.

3.1 Theories and models

Referring to the classification of Ngai et al. (2015), the theoretical foundations for employee use of public social media include four categories, namely: (1) personal behavior theories, (2) social behavior theories, (3) organizational behavior theories, and (4) mass communication theories. Table 1 lists the theories and models mentioned in the identified 59 papers.

Insert Table 1 Here

3.1.1 Personal behavior theories

Personal behavior theories included 13 theories and models, which are presented in Table 1. Some representative theories will be discussed in detail later.

Self-Determination Theory (SDT) was originally proposed by Ryan et al. in 1985, focusing on the extent to which people see their action as volitional and self-determined (Deci, & Ryan, 1985; Ryan, Connell, & Deci, 1985). SDT assumes that humans are

active organisms which possess an active tendency towards psychological growth, endowed with innate efforts to cope with ongoing challenges and to assimilate new experiences (Ryan, & Deci, 2002). SDT views motivation as a continuum of extrinsic and intrinsic motivation, according to the degree of self-determination. Extrinsic motivation can be divided into external, introjected, identified and integrated regulation, according to the degree to which external regulation and one's self is internalized (Ryan & Deci, 2002). SDT believes that social contexts and individual basic needs work together to promote internal motivation and the internalization of external motivation by satisfying three psychological needs: autonomy, competence and relatedness, and consequently these promote individual work behaviors and mental health (Ryan, & Deci, 2002). This theory is widely used to study employee attitudes and behaviors. The most recent research on SDT examines how employees' public social media use affects job satisfaction, need satisfaction and intrinsic work motivation. For example, Demircioglu and Chen (2019) found that employees' public social media use for work purposes would increase need satisfaction and intrinsic work motivation, but excessive use may have the opposite effect.

The Technology Acceptance Model (TAM), put forward by Davis (1989), is one of the most widely-adopted technology acceptance theories in the field of information systems research. It is widely adopted to study the acceptance of various information technologies. The theory advocates that perceived usefulness and ease of use are the key factors affecting technology acceptance, which directly determines user attitudes and behavioral intentions towards information technology (Davis, 1989). TAM is mainly used to study employee learning and knowledge sharing behaviors in the context of public social media. Yang and Lin (2011) found that perceived usefulness and ease of use positively affect employee usage of Facebook groups to support problem-based learning. Papadopoulos, Stamati and Nopparuch (2013) examined the impact of social influence, technology acceptance, and social cognitive factors on employees' intentions to share knowledge via web blogs.

Social Cognitive Theory (SCT) consists of three interacting determinants which are personal factors in the form of cognitive, affective and biological events, and

behavioral patterns and environmental events (Bandura, 1999). This means that individuals' cognition and emotion will affect their behavioral patterns and the environment; the environment will affect an individual's cognition, emotions and behavioral patterns, while the behavioral patterns may also change the individual's cognition, emotions and the environment. Consequently, individual behaviors are jointly determined by personal factors, behavioral patterns and environmental factors. Bandura (1999) emphasized that perceived self-efficacy is one of the most important elements of the SCT. The SCT can help us better understand employee usage behavior of public social media and the related outcomes from the perspective of the dynamic and reciprocal relationship of personal factors, behaviors and the environment (Carlson et al., 2016). According to SCT, social media platforms may lead people to have different perspectives about the world and themselves, and employees may use social media for different purposes (Carlson et al., 2016). Existing studies have used SCT to study employees' public social media usage behaviors and its potential impact. For instance, Moqbel and Kock (2018) used SCT to investigate the negative impact of public social media use on employees' work performance and health.

3.1.2 Social behavior theories

Social behavior theories include four theories, of which social capital theory is the most widely investigated, as shown in Table 1. Next, we will discuss the application of social capital theory in employees' public social media usage.

Social capital is the integration of current or potential resources which are related to possessing a lasting network, in which the familiar relationship has been institutionalized; in other words, these resources are related to members' network identities and can provide support to each member of the network through collectivity-owned capital (Bourdieu, 1986). Further, this capital has multiple meanings and it can give credit to members. Social capital theory thus is rooted in concepts, such as trust, norms, and informal networks, which firmly agree that social relationships are valuable resources (Yasunobu & Bhandari, 2009). Common types of social capital include: structure and cognitive social capital; bonding, bridging, and maintained social capital; strong and weak ties; and horizontal and vertical networks (Yasunobu & Bhandari,

2009).

In research that explores employee use of public social media, the common types of social capital are: bridging and bonding social capital (Sias & Duncan, in-press); structural, relational and cognitive social capital (Ali-Hassan et al., 2015); online bridging and bonding social capital (Huang & Liu, 2017); and trust, shared vision and network ties (Cao et al., 2015; Cao et al., 2016; Delavari & Badizadeh, 2018). Social capital is often used to explain the relevant outcomes of employees' public social media usage, with social capital being a mediator. Ali-Hassan et al. (2015) found that three different public social media use behaviors exist, including social use, hedonic use and cognitive use, which influences structural social capital, relational social capital and cognition social capital in different ways, thus indirectly promoting their routine and innovative performance. Cao et al. (2016) proved that employees' public social media usage for work purposes promotes knowledge transfer and individual job performance by increasing shared vision, trust and network ties. Huang and Liu (2017) found a positive impact of work-related Facebook informational usage on job satisfaction with online bond social capital being a mediator. Sias and Duncan (in-press) identified that the positive relationship between employees' interaction with the company Facebook page and organizational identification was partially mediated by bridging social capital.

3.1.3 Organizational behavior theories

Organizational behavior theories include five theories and models, of which the Job Demands-Resources Model and the Boundary Theory are most often used.

The Job Demands-Resources model (JD-R), proposed by Demerouti et al. (2001), is a theoretical model which explores the impact of job characteristics on outcome variables, such as burnout and job engagement (Bakker & Demerouti, 2007). It's origin can be traced back to the well-known Demand-Control Model (DCM), proposed by Karasek (1979). The DCM states that an individual's job strain is jointly determined by job demands (especially work overload and time pressure) and job control (Bakker & Demerouti, 2007). Although this theory has been widely used in studies relating to job stress and health, it also has several weaknesses, such as lack of potential room for the absorption of other job-related factors (Bakker & Demerouti, 2007). Thus, Demerouti

et al. (2001) established the JD-R model by enriching the connotation of job demands and job resources.

The core assumption of the JD-R holds that each occupation has unique factors that affect workers' physical and mental health and their working conditions, all of which can be attributed to job demands and resources (Demerouti et al., 2001). Job demands refer to physical, psychological, social or organizational aspects of a job that require sustained physical and/or psychological (cognitive and emotional) effort or skills and, thus, are associated with certain physiological and/or psychological costs (Demerouti et al., 2001). Job resources refer to physical, psychological, social or organizational aspects of employment that are either functional in achieving work goals, reducing job demands and the associated physiological and psychological costs, or stimulating personal growth, learning, and development (Demerouti et al., 2001).

Job demands and resources correspond to the process of job strain and motivation respectively. Job demands are the main predictors of the health impairment process. Excessive job demands or excessive working hours can lead to health impairment and burnout. Job resources have the potential for motivation, which promotes high work engagement and excellent performance (Bakker & Demerouti, 2007). Moreover, the JD-R model proposes that the interaction between job demands and job resources is important for the development of job strain and motivation. For one thing, it is proposed that job resources may counteract the impact of job demands on job strain and burnout; in addition, under the conditions of high job demands, the motivational effect of job resources is more significant (Bakker & Demerouti, 2007).

The JD-R model is used to examine the influencing factors and potential outcomes of employees' use of public social media platforms. Job demands may affect intensity in using social media during working hours (Charoensukmongkol, 2014). Work-related public social media use by employees may lead to both job demands and job resources, which in turn may affect an employee's mental health and workplace performance (van Zoonen & Rice, 2017; van Zoonen, Verhoevenn, & Vliegenthart, 2017). For instance, Charoensukmongkol (2014) evidenced that job demands positively impact the intensity of social media use. Based on the JD-R model, van Zoonen et al. (2017) found that

employees who use social media for work purposes increase job engagement by promoting job resources and increase employee's exhaustion by increasing job demands.

The Boundary Theory focuses on the process and results of permeability between mutually independent domains (Yang, 2020). Boundaries refer to *"physical, temporal, and cognitive limits that define domains as separate from one another and define components within domains"* (Kreiner, Hollensbe, & Sheep, 2006, p. 1319). The boundary theory argues that work domains and non-work domains are two different areas where employees create physical, temporal and psychological boundaries to manage and simplify their work roles and non-work roles (van Zoonen & Banghart, 2018; van Zoonen, Verhoeven, & Vliegenthart, 2016; Yang, 2020). Furthermore, the typical work area is the workplace, while the typical non-work area is home life. In the workplace, an individual is often referred to as an employee and assumes the role of fulfilling tasks assigned by superiors and organizations as well as dealing with workplace relations, while an individual may be a father, mother, son or daughter at home and may play the role of doing housework, taking care of parents and educating her or his children. To avoid potential chaos in their work and family roles, individuals may try to allocate their time reasonably, and adopt different ways of thinking, emotional expression and behavioral patterns (van Zoonen & Banghart, 2018; van Zoonen et al., 2016). In other words, they build time and psychological boundaries to manage and simplify the two roles.

The theory suggests that individuals have different preferences for the degree of segmentation of the work and non-work boundary. Individuals with higher segmentation preferences tend to separate work and non-work related roles, while individuals with lower segmentation preferences tend to integrate work and non-work roles (van Zoonen & Banghart, 2018; van Zoonen, Verhoeven, & Vliegenthart, 2016; Yang, 2020). Employees can access public social media both inside and outside of the workplace, on and off the clock, and through company-issued and/or personally-owned devices (van Zoonen & Banghart, 2018). In turn, the heightened fluidity and increasing visibility of communication that crosses multiple life domains have complicated the

ability for employees to maintain discrete personal/professional boundaries, positioning active boundary management as a critical employment competency of the digital age (van Zoonen & Banghart, 2018). Some researchers have used boundary theory to examine employee public social media usage behavior and its impact. Van Zoonen et al. (2016) used boundary theory to examine the positive and negative effects of public social media use for work purposes. van Zoonen and Banghart (2018) combined the boundary theory with longitudinal survey data to investigate the influence of social media-based work communication on employee engagement and found that work-based communication on social media will mediate the positive impact of boundary preferences to employee engagement.

3.1.4 Mass communication theories

Mass communication theories include four theories and models, with media richness theory and media synchronicity theory used more frequently, as shown in Table 1.

Media richness theory explains media choice as a rational process resulting from a match between the task and medium characteristics (Daft & Lengel, 1986; Daft, Lengel, & Trevino, 1987). Media richness refers to the potential information capacity of the media, which can be judged via four dimensions: immediacy of feedback, multiplicity of cues, language variety and personal focus (Daft et al., 1987). The theory holds that organizational tasks have two basic information purposes, namely, meeting the demands for information and reducing the degree of equivocality. In organizational management, the degree of coordination between task complexity and media richness affects the communication effectiveness inside and outside the organization (Daft et al., 1987). Media of high richness help to fulfill tasks which are complex, with requirements for large amounts of information and with high levels of ambiguity while media of low richness fit into routine and easy-to-understand tasks. Using media of appropriate richness can reduce uncertainty and equivocality in communication and then meet the demands of the organization to cope with external changes, to coordinate internal affairs and to solve problems (Daft & Lengel, 1986; Daft et al., 1987). But if they do not match, there will be problems such as insufficient

information supply, inability to support decision-making or information overload, and increased task complexity (Daft & Lengel, 1986; Daft et al., 1987). Specific to the researches on the use of public social media by employees, Koo et al. (2011) used media richness theory to examine how task characteristics affect employees' use behaviors of social communication technologies and the mediating role of social influence and social affinity. Lee and lee (2018) studied the impact of Facebook usage on the job performance of office workers and the moderating effects of task characteristics on the basis of media richness theory.

Media synchronicity theory emphasizes that the match between media synchronicity capacity and the requirements of communication processes affects communication performance (Dennis, Fuller, & Valacich, 2008; Dennis & Valacich, 1999). Media synchronicity capacity is influenced by five media traits, including transmission velocity, parallelism, symbol sets, rehearsability and reprocessability. Media synchronicity theory believes that all tasks need to go through two basic communication processes, namely the conveyance process and the convergence process. Each task contains these two communication processes and has different demands for the two processes. In addition, the theory also considers the moderating role of the degree of media attributes, training, social norms and past experiences. Specific to the employees' public social media usage, Ou et al (2013) examines the impact of the use of social networking tools on job performance on the basis of media synchronization theory. Lee and Lee (2018) used media synchronicity theory to examine the impact of Facebook usage on the performance of office workers and the moderating role of task traits. Cao et al. (2016) used media synchronicity theory to explore the impact of social networking tools on employees' performance at work.

3.2 Casual-chain framework of employees' use of public social media

With reference to Ngai et al (2015), the causal-chain framework for employees' public social media use is organized by the sequence of independent variables, moderators, mediators and outcome variables. The input of the independent variable is the direct cause of the outcome variable. The mediator is used to explain the causality between the independent variable and the outcome variable, and the moderator is used

to explain the influence intensity and direction of the independent variable on the outcome variable (Ngai et al., 2015). The independent variables, moderator, mediator and outcome variables used in the 59 identified articles appear in groups in the corresponding positions of the causal-chain framework, as shown in Figure 1. Considering the differences of research purposes, the same variable may appear disparate between different studies (Ngai et al., 2015). For example, Yang and Lin (2011) used social influence as an independent variable, while Koo et al. (2011) used social influence as a moderator. It means that the same variable may appear at different locations in the causal chain framework (Ngai et al., 2015).

Insert Figure 1 Here

3.2.1 Antecedents

Analysis of the identified literature demonstrates that the independent variables involve three dimensions: (1) Social factors, (2) User attributes, and (3) Organizational (behavior) attributes, among which user attributes received most interest.

3.2.1.1 Social factors. Social factors focus on the motivation of employees to use public social media in the social psychological dimension. Previous studies have rarely used social factors as antecedent variables to examine the use of public social media by employees. Studies on social factors are scattered, involving factors such as social influence, subjective norm, social identity, group norm, social presence and social interactions. Examples include the studies of Yang & Lin (2011), Papadopoulos et al. (2013), Kwahk and Park (2018), and Van Puijenbroek et al. (2018). For example, Yang and Lin (2011) found that social influence increases employees' perceived usefulness in a Facebook group which, in turn, prompts more employees to use the Facebook group for problem-oriented learning. Papadopoulos et al. (2013) identified three social factor variables, social influence, social identity and group norm, which were seen to have no effect on the web blog-based knowledge sharing behaviors of employees. Kwahk and Park (2018) found that both social presence and social interactions positively influence employee performance through transactive memory capability in the context of social media.

3.2.1.2 User attributes. User attributes are the input variables most often applied

by researchers, focusing on factors such as user behavior, user characteristics, user experience and user perceptions. User behavior is the most frequently used antecedent in existing research, with it mainly using employee public social media usage behavior as an antecedent. Early studies used 'social media use intensity' as an antecedent variable, such as the studies of Moqbel et al (2013), Charoensukmongkol (2014), Charoensukmongkol (2016), and Carlson et al. (2016). For example, Moqbel et al. (2013) studied the impact of employee SNS intensity on individual job performance. Charoensukmongkol (2016) examined the impact of Facebook use intensity at work on job burnout. However, most studies have employed work-related social media as an antecedent variable, including the studies of Cao and Ali (2018), Cao et al. (2015), Cao et al. (2016), Delavari and Badizadeh (2018), Demircioglu (2018), Demircioglu & Chen (2019), Lee and Lee (2018), Leftheriotis and Giannakos (2014), Sigala and Chalkiti (2015), van Zoonen et al. (2016), van Zoonen et al. (2017), van Zoonen and Rice (2017), and Yan et al. (2013). For example, Cao and Ali (2018) analyzed how work-related social media use affects a team's creative performance. Leftheriotis and Giannakos (2014) investigated the effect of social media use on work performance.

A few studies have begun to use two or more social media usage behaviors as antecedent variables, including Ali et al. (2019), Ali-Hassan et al. (2015), Cao and Yu (2019), Landers and Callan (2014), and Zhang et al. (2019). For example, Ali et al. (2019), Ali-Hassan et al. (2015), and Cao and Yu (2019) studied the potential outcomes of social, hedonic and cognitive use of public social media by employees. Zhang et al (2019) examined how work-related and social-related social media use affects job satisfaction and the turnover intention of employees. Landers and Callan (2014) divided work-related social media usage into beneficial use and harmful use (e.g., creating offensive content that offends their coworkers and supervisors, stopping their daily tasks during working hours to wandering around on social media and posting content that may damage organizational reputation), examining its differentiated impact on individual job performance. The latest studies have used excessive use of social media at work as an antecedent, including the studies of Cao and Yu (2019), and Yu et al. (2018).

There are also studies which have utilized user characteristics as antecedent variables, and most have explored how user characteristics affect employees' public social media usage behavior. Furthermore, the user characteristics which have been studied include self-efficacy (Papadopoulos et al., 2013; Yang & Lin, 2011), apathetic motivation (Hansen & Levin, 2016), age (Kwahk & Park, 2018; Tormo-Carbo' et al., 2014), educational level (Tormo-Carbo' et al., 2014), gender (Tormo-Carbo' et al., 2014) and big five personality (Andreassen et al., 2014; Choi, 2018; Kim & Chung, 2014). For example, Yang and Lin (2011) employed computer self-efficacy of individual employees to understand employee intentions in using Facebook groups for problem-based learning. Papadopoulos et al. (2013) investigated the effects of self-efficacy on employees' intentions of sharing knowledge through web blogs. Hansen & Levin (2016) examined how apathetic motivation of employees influenced their business-related social media use. Kwahk & Park (2018) studied the relationship between age and work-related Web 2.0 usage. Further, Andreassen et al. (2014) and Choi (2018) examined the role of big five personality in social media usage behaviors of individual employees.

User perception is used as an antecedent variable to study the formation mechanism of employees' public social media usage behaviors, such as that adopted in the studies of Behringer & Sassenberg (2015), Khan et al. (2014), Papadopoulos et al. (2013), and Yang and Lin (2011). These studies focused on variables such as perceived usefulness, perceived ease of use, perceived importance and perceived enjoyment. For example, Behringer and Sassenberg (2015) investigated the effects of perceived usefulness and perceived importance on employees' intention of using social media for knowledge seeking and knowledge contribution. Khan et al. (2014) examined the perceived benefits and risks to analyze the SNS use intentions of government employees. Papadopoulos et al. (2013) found that perceived enjoyment increased employee intentions to share knowledge via web blogs by facilitating their positive attitude towards knowledge sharing, but the effects of perceived usefulness and perceived ease of use were not supported. Yang and Lin (2011) confirmed that perceived enjoyment positively predicted employees' use of Facebook groups for

problem-based learning.

In addition, some scholars have used social media experience as an antecedent variable. Behringer and Sassenberg (2015) found that the social media experience of individual employees had a positive impact on their knowledge contribution intention, but had no effect on knowledge seeking intention through social media.

3.2.1.3 Organizational (behavior) attributes. There have been few studies on the usage of organizational (behavior) attributes as antecedents. The most representative of these is based on the JD-R model, which studied the impact of job demands and job resources on employees' public social media usage behavior (Andreassen et al., 2014; Charoensukmongkol, 2014; Walsh, Schaarschmidt, & Von Kortzfleisch, 2016). For example, Andreassen et al. (2014) employed quantitative job demands and several dimensions of job resources to predict non-work related SNS use at work. Charoensukmongkol (2014) investigated the effects of job demands on social media use intensity at work. Walsh et al. (2016) examined the impact of two different job resources, feedback and opportunity for development, and two different job demands which were role ambiguity and role conflict, on the social media capabilities associated with corporate reputation. There have also been studies that used organizational policies of social media as antecedent variables (Andreassen et al., 2014; Fusi & Feeney, 2018). Andreassen et al. (2014) found that organizational policies which prohibit employees from using social media for private affairs at work significantly reduce the use of non-work related social media during working hours. Fusi and Feeney (2018) demonstrated that social media organizational policies were positively affecting managers' perceptions towards social media. In addition, organizational culture (Fusi & Feeney, 2018), organizational identification (van Zoonena et al., 2018), workplace ostracism which emphasizes that the extent to which an individual becomes aware of exclusions or overlooks by others at work (Chung & Kim, 2017), HR practices (Naim & Lenka, 2017), task characteristics (Koo et al., 2011), and variables such as workplace support (Charoensukmongkol, 2014) are also considered as antecedent variables in some studies.

3.2.2 Moderators

Moderators are often used to explain the influence intensity and direction of independent variables on outcome variables (Ngai et al., 2015). The moderators used in research exploring employee public social media use can be divided into three categories: (1) social factors, (2) user attributes, and (3) organizational (behavior) attributes.

3.2.2.1 Social factors. There have been few studies that have focused on social factors, with only Koo et al. (2011) investigating these fully. Koo et al. (2011) found that social affinity and social influence can enhance the positive impact of task urgency on job-related instant Messaging use, while social affinity weakens the positive impact of task analyzability on job-related blog use.

3.2.2.2 User attributes. User attributes are mainly composed of user perception, user behavior and user characteristics, of which user perception is the least significant. Behringer and Sassenberg (2015) found that perceived deficits positively moderate the willingness of employees to contribute knowledge and exchange knowledge through social media. In terms of user behavior, existing research has focused on workplace SNS usage (Chung & Kim, 2017), SNS use (Kim & Chung, 2014), social media use (Naim & Lenka, 2017), preoccupation (Carlson et al., 2016), social media advocacy (Schaarschmidt & Walsh, in press), and responsiveness of employees (van Zoonen & Rice, 2017) as moderators. Chung & Kim (2017) found that the workplace SNS usage of employees alleviates the negative impact of workplace ostracism on innovative behavior and job satisfaction, but that it reduces the positive impact of job satisfaction on innovative behavior. Kim & Chung (2014) found that SNS use by employees enhances the positive impact of extroversion to job satisfaction, but that it reduces the positive impact of agreeableness to job satisfaction. Naim and Lenka (2017) employ the social media use of employees as a moderator to study the relationship between HR practices and employee engagement. As for user characteristics, mindfulness, which refers to the ability of individuals to be aware of the present moment they are experiencing in a non-judgmental way (Charoensukmongkol, 2016), apathetic motivation (Hansen & Levin, 2016), and gender (Zhang et al., 2019) are the most significant moderators in identified literature. For instance, Charoensukmongkol (2016)

used mindfulness as a moderator to examine the effects of social media use intensity at work on job burnout. Hansen and Levin (2016) investigated the moderating role of apathetic motivation in the relationship between intrinsic and extrinsic motivation, and intention of using social media for business.

3.2.2.3 Organizational (behavior) attributes. Existing research has focused on organizational social media policy (van Zoonen et al., 2016; Wickramasinghe & Nisaf, 2013), job characteristics (Bizzi, 2017; Hansen & Levin, 2016; Lee & Lee, 2018), perceived organizational support (Choi, 2018), and organizational culture (Van Puijenbroek et al., 2014). van Zoonen et al. (2016) investigated the moderating role of social media policies against the relationship between work-related social media use and work to life conflict or life to work conflict. Wickramasinghe and Nisaf (2013) found that loose organizational policies can enhance the positive impact of social networking use which is supportive to individual job performance, yet loose organizational policies may also weaken the negative effects of social networking use which disrupts the job tasks and workplace on individual job performance. In terms of job characteristics, Bizzi (2017) examined the moderating role of formal interactions in the process of social media use on intrinsic motivation and proactive behavior. Hansen and Levin (2016) used employees' work roles as a moderator to examine the impact of apathetic motivation on employees who use social media for business. Lee & Lee (2018) found that task interdependence weakens the positive impact of Facebook use on individual job performance. Additionally, Choi (2018) proved that perceived organizational support attenuates the positive impact of narcissism on SNS addiction. Van Puijenbroek et al. (2014) found that an organizational culture of dialogue and inquiry does not moderate the positive impact of social media use on work-related learning.

3.2.2 Mediators

The mediators involved in employee public social media use research can be divided into three categories, namely: social factors, user attributes, and organizational (behavior) attributes.

3.2.2.1 Social factors. Social capital is the only mediator relating to social factors

found in our investigation, which included the studies of Ali-Hassan et al. (2015), Cao et al. (2015), Cao et al. (2016), Delavari and Badizadeh (2018), Huang & Liu (2017), and Sias and Duncan (in press). Social capital is a multi-dimensional concept with existing research commonly dividing it into three categories: (1) structural social capital, (2) cognitive social capital and (3) relational social capital (Ali-Hassan et al., 2015; Cao et al., 2015; Cao et al., 2016; Delavari and Badizadeh, 2018). For instance, Ali-Hassan et al. (2015) used the three dimensions of social capital to explain the specific influencing mechanisms of different social media usage behaviors on both routine and innovative job performance at the individual level. Both Cao et al. (2016) and Delavari and Badizadeh (2018) employed the three dimensions of social capital to examine the effects of social media use at work on work performance of employees. Cao et al. (2015) investigated the mediating role of the three dimensions of social capital on the relationship between social media use at work and knowledge integration. Social capital can also be divided into bridging social capital and bonding social capital (Sias and Duncan, in press). Sias and Duncan (in press) found that bridging social capital partially mediates the relationship between Facebook interaction and organizational identity of the employees and organizations. Online social capital is investigated and classified into online bridging and bonding social capital (Huang & Liu, 2017). Huang & Liu (2017) used the two dimensions as a mediator to study the impact of three types of Facebook use on employees' job satisfaction and performance.

3.2.2.2 User attributes. There have been few studies focusing on user attributes, which include user perceptions, user characteristics and user behavior. In terms of user perceptions, Demircioglu (2018) employed perceived autonomy, perceived competence, and perceived relatedness as mediators to investigate the impact of work-related social media use on the job satisfaction of government employees. For user characteristics, mindfulness (Sriwilai & Charoensukmongkol, 2016) and positive emotions (Moqbel & Kock, 2018) are the main focus of conducted studies. Sriwilai & Charoensukmongkol (2016) examined the mediating role of mindfulness in the relationship between social media addiction and emotional exhaustion. Moqbel & Kock (2018) used positive emotions as a mediator to analyze the effect of SNS addiction on individual job

performance and the health of employees. As for user behavior, it includes social media addiction (Choi, 2019) and work communication, based on social media (van Zoonen & Banghart, 2018). Choi (2019) used social media addiction as a mediator to examine the impact path of narcissism on employees' job satisfaction and organizational commitment. Van Zoonen & Banghart (2018) found that employee work communication, based on social media, partially mediated the influence of boundary preferences on employee engagement by using three-wave panel data.

3.2.2.3 Organizational (behavior) attributes. Existing studies have focused predominantly on job satisfaction (Charoensukmongkol, 2014; Chung & Kim, 2017; Moqbel et al., 2013; Zhang et al., 2019), work conflict (Cao & Yu 2019; van Zoonen et al., 2016; van Zoonen et al., 2017), and work pressure/strain (Cao & Yu, 2019; van Zoonen & Rice, 2017). With regard to job satisfaction, Charoensukmongkol (2014) demonstrated that job satisfaction mediates the impact of employees' social media use intensity at work on cognitive absorption, but the mediating role in the relationship between social media use intensity and individual job performance is not supported. Chung & Kim (2017) used job satisfaction as a mediator to study the impact of SNS use on employees' innovation behavior. Moqbel et al. (2013) found that job satisfaction would mediate the impact of SNS use intensity on individual job performance.

In terms of work conflict, this includes technology-work conflict (Cao & Yu, 2019), work-life conflict (van Zoonen et al., 2016; van Zoonen et al., 2017), and life-work conflict (van Zoonen et al., 2016). Cao & Yu (2019) found that the technology-work conflict would mediate the influence of both excessive hedonic use and social use on an employee's work strain. Van Zoonen et al. (2016) and van Zoonen et al. (2017) investigated the mediating role of work-life conflict on the relationship between work-related social media use and emotional exhaustion and work engagement. Additionally, Zhang et al. (2019) used job engagement, organizational engagement, organizational commitment and job satisfaction as mediators to study the impact of work-related social media use and social-related social media use on turnover intention. Van Zoonen & Rice (2017) considered the mediating role of work pressure and job autonomy when studying the effects of personal social media use for work on exhaustion and work

engagement. Meanwhile, task distraction (Moqbel & Kock, 2018), team creative efficacy (Ali et al., 2019) and knowledge transfer (Cao et al., 2016) were also used as mediators in existing studies.

3.2.4 Outcomes

Existing literature focuses most on job performance, followed by the employee's social media use behavior, job satisfaction, work engagement, job burnout, employee creativity and intrinsic work motivation. Other outcome variables included proactive work behaviors (Bizzi, 2017), organizational commitment (Choi, 2018), organizational identification (Sias & Duncan, in press), turnover intention (Zhang et al., 2019), innovative behavior (Chung & Kim, 2017), work-related learning (Van Puijenbroek et al., 2014), social power (Diga & Kelleher, 2009) and workplace *Guanxi* (Yang, 2020). It is worth noting that Guanxi in Chinese expresses metaphorically linked relationships or personal ties in a closed network, and this translation conveys China's special cultural background and implies the connections established for long-term exchanges and reciprocity (Yang, 2020). This study will now discuss the seven types of outcome variables that receive most attention.

In terms of job performance, although it is a multi-dimensional concept, most studies have regarded it as a holistic concept to investigate the effect of employees' use of social media on overall job performance at the individual level (Cao et al., 2016; Cao & Yu, 2019; Carol et al., 2013; Charoensukmongkol, 2014; Delavari & Badizadeh , 2018; Huang & Liu, 2017; Kwahk & Park, 2018; Lee & Lee, 2018; Leftheriotis & Giannakos, 2014; Moqbel et al., 2013; Tulu et al., 2017; Wickramasinghe & Nisaf, 2013; Yu et al., 2018). For example, Cao &Yu (2019) examined the influence of three dimensions of excessive social media use at work on individual job performance. Huang and Liu (2017) explored how three dimensions of work-related Facebook usage affected individual job performance. Moqbel et al. (2013) and Charoensukmongkol (2014) investigated the relationship between social media use intensity at work and individual job performance. Lee & Lee (2018) and Leftheriotis and Giannakos (2014) analyzed the effects of work-related social media use on individual job performance. Cao et al. (2016), Carol et al. (2013), Delavari and Badizadeh (2018) and Yu et al. (2018)

studied the impact of social media use at work on individual job performance.

There have also been studies that focused on specific dimensions of job performance at the individual level, such as individual task performance (Koo et al., 2011). In addition, Ali-Hassan et al. (2015), Landers and Callan (2014), and Moqbel & Kock (2018) use multiple dimensions of individual job performance as outcome variables. Ali-Hassan et al. (2015) in particular investigated the influence of the three dimensions of social media use on routine and innovative performance. Landers and Callan (2014) analyzed the effects of both beneficial and harmful work-related social media use on the four dimensions of individual job performance, including task performance, contextual performance, adaptive performance and counterproductive work behavior. Moqbel and Kock (2018) studied how SNS addiction influences individual in-role performance and innovative performance.

It is worth noting that some pioneering scholars have started to investigate job performance at the team level (particularly team creative performance), in addition to individual job performance (Ali et al., 2019; Cao & Ali, 2018). Cao & Ali (2018) found that social media use at work by an individual employee as a member of the team would enhance team creative performance through transactive memory system. Ali et al. (2019) reported that all three dimensions of social media use at work by an individual employee who belongs to a team would increase creative performance of the team through transactive memory system and team creative efficacy. However, none of these studies have explored the potential influence of an individual employee's use of public social media at work on job performance at the organizational level.

In terms of social media behavior, this mainly includes behavioral intention and actual usage behavior. In terms of behavioral intention, Behringer and Sassenberg (2015) studied the determinants of the behavioral intention of employees to share knowledge and seek knowledge through social media. Hansen and Levin (2016) investigated the formation mechanism of employees' willingness to use social media for business. Khan et al. (2014) examined the influencing factors of social media use intention of government employees. Papadopoulos et al. (2013) explored the determinants of employees' intentions to share knowledge via web blogs. Yang and Lin

(2011) employed the TAM to analyze employee intention of using Facebook groups for problem-based learning. As for actual usage behaviors, this includes work-related social media use (Tormo-Carboʹ et al., 2014; van Zoonen et al., 2014), social media use intensity at work (Charoensukmongkol, 2014), social media addiction (Choi, 2018), personal SNS use at work (Andreassen et al., 2014), Facebook boundary management (van Prooijen et al., 2018), and ambassadorship behaviors on Facebook and LinkedIn (van Zoonen et al., 2018). Additionally, Carlson et al. (2016) used task-oriented social media behaviors, relationship-oriented social media behaviors and deviant social media behaviors as outcome variables.

Studies referring to job satisfaction as an outcome variable could be divided into three categories. Firstly, some consider employees' social media usage behavior as a mediator or moderator. Choi (2018) used social media addiction at work as a mediator variable when studying the impact of narcissism on job satisfaction. Chung and Kim (2017) used workplace SNS use as a moderator to examine the impact of workplace ostracism on job satisfaction. Kim & Chung (2014) explored the impact of big five personality traits on job satisfaction and the moderating role of SNS use. Secondly, some examine the direct effect of employee social media use on job satisfaction. Charoensukmongkol (2014) found that social media use intensity at work had a positive and direct effect on job satisfaction. Robertson and Lee (2017) analyzed the impact of employees' interactions with colleagues by using Facebook on their job satisfaction. Finally, others introduce mediators or moderators to study the influencing path of social media use on job satisfaction. Demircioglu (2018) used self-determination theory to examine the mediating role of perceived competence, perceived relatedness and perceived autonomy in the relationship between work-purposed social media use and job satisfaction. Huang and Liu (2017) investigated the impact of three different types of job-related Facebook use behaviors on job satisfaction and the mediating role of online social capital. Zhang et al. (2019) examined the impact of work-related and social-related social media use on job satisfaction and the mediating role of employee engagement and organizational commitment.

Work engagement as an outcome variable is studied by Charoensukmongkol

(2014), Naim and Lenka (2017), Syrek et al. (2017), van Zoonen and Banghart (2018), van Zoonen et al. (2017), and van Zoonen and Rice (2017). Charoensukmongkol (2014) found that job satisfaction fully mediated the relationship between workplace social media use intensity and a specific dimension of work engagement, namely cognitive absorption. Naim and Lenka (2017) examined the effect of HR practices on work engagement and the moderating role of social media use by employees. Syrek et al. (2017) analyzed the direct effect of non-work related social media use in the workplace on work engagement by using ecological momentary assessment. Van Zoonen and Banghart (2018) investigated the influence of boundary management preferences on work engagement and the mediating role of work communication based on social media. van Zoonen et al. (2017), and van Zoonen and Rice (2017) systematically studied the specific influence path of work-related social media use on work engagement.

For job burnout, Charoensukmongkol (2016) analyzed the relationship between workplace social media use intensity and the three dimensions of job burnout, namely emotional exhaustion, lack of personal accomplishment and depersonalization, and the moderating role of mindfulness. Most studies are seen to focus on the emotional exhaustion aspect of job burnout (Sriwilai & Charoensukmongkol, 2016; van Zoonen et al., 2016; van Zoonen et al., 2017; van Zoonen & Rice, 2017). Sriwilai and Charoensukmongkol (2016) investigated the effect of social media addiction on emotional exhaustion and the role of coping strategies and mindfulness. van Zoonen et al. (2016) explored the impact of work-related personal social media use on emotional exhaustion and the roles of life to work conflict, work to life conflict and organizational social media policies. van Zoonen et al. (2017) studied the specific influencing mechanisms of work-related social media use on emotional exhaustion by using variables such as accessibility, efficient communication, interruptions and work to life conflict. van Zoonen and Rice (2017) examined the relationship between work-related personal social media use and emotional exhaustion by integrating variables such as responsiveness, work pressure and autonomy into the research model.

With regards to employee creativity, which can be defined as the extent to which employees propose products, ideas and methods that are useful and novel to the

organization (Yan et al., 2013), Sigala & Chalkiti (2015) identified that the use of social media for knowledge management by employees positively impacts their creative abilities. Yan et al. (2013) found that both use of social media for knowledge seeking and contribution positively affects employees' creativity through perceived enjoyment. In terms of intrinsic work motivation, Bizzi (2017) studied the effect of social media use on the intrinsic work motivation of employees, the role of work-related and non-work related blog use and formal interactions. Demircioglu & Chen (2019) found that work-related social media use positively affects the intrinsic work motivation of public employees. In summary, the antecedent variables, moderators, mediators and outcome variables of employee public social media use constitute the causal-chain framework. See Table 2 for further details.

<center>Insert Table 2 Here</center>

4 Research implication and future directions

4.1 Implications

Based on the systematic investigation into empirical and representative studies on employees' public social media usage, this research identifies antecedent variables, mediators, moderators and outcome variables, and proposes the causal-chain framework of employees' use of public social media.

The antecedent variables predominantly include three categories: social factors, user attributes and organizational (behavior) attributes. Existing studies seldom use social factors as an antecedent variable to examine the use of public social media by employees, and the selection of social factor variables are also scattered. At the same time, there is no case of concentration on a specific variable. Social factors, such as antecedent variables, are mainly used to explain the reasons for specific public social media behaviors by employees. The difference is that researchers often employ user attributes as input variables. User attributes mainly include user behavior, user characteristics, user experiences and user perceptions. In the category of user attributes, user behavior is the most commonly used antecedent variable, while the employees' public social media usage behavior is mainly used as an antecedent variable. These can be divided into four categories: (1) early research uses social media intensity as an

antecedent variable; (2) most studies use work-related social media as an antecedent variable; (3) a few studies have begun to use two or more social media usage behaviors as an antecedent variable, and (4) the latest research has begun to use excessive social media usage at work as an antecedent variable.

User characteristics have also attracted attention to a certain extent, with most of these considering how user characteristics, such as personality traits, self-efficacy, and individual motivation affect employees' public social media usage. However, existing studies have rarely used social media experiences as an antecedent variable. With respect to user perceptions, research has focused on variables including perceived usefulness, perceived ease of use, perceived importance, and perceived enjoyment. As for the organizational (behavior) attributes category, the most representative one used is the JD-R model, as a theoretical basis to study the impact of job demands and job resources on employee public social media usage behaviors. In addition, organizational social media policies have begun to receive attention, but there is a lack of systematic attention to organizational culture. For example, employees in those organizations which have innovation-supportive culture may have more positive perceptions about workplace social media use and perform various social media usage behaviors in the workplace. Furthermore, Fusi and Feeney (2018) have divided organizational culture into three parts as innovativeness, centralization and routineness to study the effect of organizational culture on government employees' use of public social media.

With regards to outcome variables, work performance is the most significant, followed by the employees' social media behavior, job satisfaction, work engagement, job burnout, creativity and intrinsic work motivation. In relation to job performance, although it is a multi-dimensional concept, most studies consider job performance as a holistic concept and have analyzed the influence of public social media use at work by individual employee on overall job performance at the individual level. In addition, some studies have used multiple dimensions of individual job performance as outcome variables. There are also some studies that have focused on specific dimensions of individual job performance, such as task performance. Beside individual job performance, two pioneering studies have investigated job performance at the team

level, such as creative performance. However, none of them studied the job performance at the organizational level. In terms of social media usage behavior by employees, this includes social media use intentions and actual social media usage behaviors, with the latter being studied relatively more. Actual social media use behavior mainly focuses on work-related social media use, social media use intensity in the workplace, social media addiction, personal SNS use at work, Facebook boundary management, and ambassadorship behaviors.

Job satisfaction as an outcome variable can be divided into three categories: (1) using employees' social media usage behavior as a mediator or moderator; (2) testing the direct effect of employees' social media usage on job satisfaction; and (3) introducing mediators or moderators to study the impact path of social media usage on job satisfaction. The research into the third category needs to be strengthened in future. Research has also been conducted to explore the formation mechanism of work engagement in the social media environment. In relation to job burnout, researchers mainly focus on the emotional exhaustion dimension of job burnout. In the case of employee creativity, they focus most often on the impact of knowledge management and knowledge behavior, based on social media, on employee creativity. Researchers have also paid attention to the formation mechanism of intrinsic working motivation of employees and civil servants. Other outcome variables include proactive work behaviors, organizational commitment, organizational identification, workplace Guanxi, turnover intention, employee health, innovative behavior, work-related learning and social power. Overall, there have been many studies that have used organizational outcomes such as job performance and turnover intention, employee organization-related attitudes and work-related attitudes as outcome variables, yet there still lacks systematic attention to employee health.

Regarding the mediators, there are three categories; namely social factors, user attributes and organizational (behavior) attributes. Social capital is the only mediator of the social factor category found in this study. Existing research relating to the division of social capital dimensions can be classified into three categories: (1) dividing social capital into structural social capital, cognitive social capital and relational social capital;

(2) dividing social capital into bridging social capital and bonding social capital; and (3) investigating online social capital and classifying it into online bridging and bonding social capital. Of these categories, the first is studied most often. The category of user attributes mainly includes user perceptions, user characteristics, and user behavior, although there are few studies available. As for organizational (behavior) attributes, existing studies have mainly focused on job satisfaction and work conflict. In addition, employee engagement, organizational commitment, task distraction, team creative efficacy and knowledge transfer are also used as mediators in the identified research.

With regards to the mediators, there are three categories: social factors, user attributes and organizational (behavior) attributes. There have been few studies focusing on social factors and only a few studies were identified as having investigated the social factors in this research. User attributes are mainly composed of user perception, user behavior and user characteristics, of which user perception is the least significant. In terms of user behavior, existing studies have mainly employed workplace SNS usage, social media use, preoccupation, social media advocacy and responsiveness of employees as mediators. In relation to user characteristics, mindfulness, apathetic motivation and gender are the most major concerns. In terms of organizational (behavior) attributes, organizational policy, job characteristics, perceived organizational support and organizational culture are chiefly used as mediators in existing studies, while focus on organizational culture is limited.

4.2 Future research directions

4.2.1 Platform attributes

The extant studies have paid little attention to the platform attributes of social media. Through review of forty-six social media-related studies, Ngai et al. (2015) established that a platform's attributes would be critical mediators in the relationship between antecedents and outcomes of social media. Examples of platform attributes are tools selection and the integrity of tools (Ngai et al., 2015).

It is understood that social media platforms vary in terms of available features and functionality with many, such as Facebook, Twitter and YouTube, providing differentiated preferences aligned to seven fundamental dimensions; namely, content

sharing, identity information disclosure, social presence, relationships, conversation, groups or community development and reputation management (Kietzmann et al., 2011). For example, Facebook has its advantages in relationship maintenance and development, while YouTube focuses mainly on content sharing (Kietzmann et al., 2011; Haro-de-Rosario, Sáez-Martín, & del Carmen Caba-Pérez, 2018). Chen (2011) proved that frequency of using several functions of Twitter, such as @replies and tweeting, played a mediating role in the positive relationship between active Twitter use and individual need satisfaction of connecting with others. It implies that individual employees who frequently interact with their co-workers on Twitter may extend the breadth and depth of work-related connections and accumulate social capital through @replies and other tools provided by the platform. This, in turn, produces various positive work-related outcomes. A few studies have demonstrated that work-related connections through social media, especially Facebook, are conducive to promoting employees' work-related social media use, enhancing employee psychological perceptions of organizational support and further facilitating their job satisfaction and performance (Schmidt et al., 2016; Huang & Liu, 2017).

Platform attributes can also be indispensable determinants of employees' use of public social media, according to the Information System Success Model, proposed by DeLone and McLean (1992). The model contends that system and information quality jointly determine the use and satisfaction of user information systems, which ultimately results in individual and organizational impact (DeLone & McLean, 1992). The IS success model, and its core constructs, especially system quality and information quality, have been widely employed to explain the usage behavior of information and communication technology. Kwon, Park and Kim (2014) found that system and service quality directly and positively influences individual intention to use both Facebook and Twitter. Social media platforms with a higher level of system quality lead to better user experiences for individual employees. This, in turn, not only motivates employees to display continuing usage behaviors, but to actively explore different functions of social media across their personal and professional lives. It also reasonably argues that system quality or service quality of social media may positively affect employees' use of social

media, including personal and work-related use. Thus, the role of social media platforms' attributes deserves further investigation. For example, how do platform characteristics influence individual employee use of specific public social media for diverse purposes, and what are the underlying mechanisms? How do social media characteristics moderate or mediate the effect of other antecedents (social factors, user attributes and organizational attributes) on various outcomes?

4.2.2 Social power

Currently-available studies have increasingly investigated the role of social factors on employees' use of public social media and related outcomes, especially social influence and social capital. However, social media researchers have not yet studied the social power variable adequately. Social power is the ability of an individual or a group to make other individuals or groups change in the direction of its intentions (Busch & Wilson, 1976). It commonly consists of reward power, coercion power, legitimate power, expert power, referent power and informational power (French & Raven, 1959; Raven, 1993). Reward power relates to the power which gives positive results or removes negative results. Coercive Power is the power to punish people who disobey instructions. Legitimate Power is the power of action for a certain position through election or appointment, also known as Organizational Authority or Normative Power. Referent Power is the power derived from being a reference model for others. Expert Power comes from the specialty, expertise and special skills of the individuals and, finally, Informational Power relies on the control of important information that is necessary for someone else (French & Raven, 1959; Raven, 1993).

The concept of social power has been extensively applied in the field of social exchange, organizational policy-making and other organizational behavior topics (Busch & Wilson, 1976). For instance, Mossholder, Bennett, Kemery, and Wesolowski (1998) confirmed that employee perceptions of their supervisor's coercive, expert and referent power would affect their job satisfaction and organizational commitment through the mediating role of procedural justice. Reiley & Jacobs (2016) found that employee perceptions of their Leaders' referent, expert and reward power use would predict their organizational citizenship behaviors. Regarding the prevalence of social

media use within an organizational context, it is worth investigating how employees' use of public social media, especially when interacting with supervisors (e.g., obtaining emotional support from the supervisor through social media), influences their perceptions of supervisor power, and further resulting in differentiated outcomes, including organizational citizenship behaviors, job satisfaction, perceived procedural justice and the organizational commitment of employees.

It is noteworthy that scholars in the field of public relations have endeavored to explore the effects of public relation practitioners' ICT use on their power. Sallot, Porter, and Acosta-Alzuru (2004) carried out a focus group interview with 35 public relations practitioners, and established that public relations practitioners use the web for activity evaluation, two-way communication, productivity and efficiency; this further increased their structural power, expert power, prestige power and ownership power. Further empirical research has found that public relations practitioners, who frequently use websites for productivity and efficiency, tend to perceive more structural power, expert power and prestige power (Porter & Sallot, 2005). Using the web for the purpose of problem communication positively influences the perception of expert power and prestige power of the public relations practitioners, while website use for the purpose of activity evaluation positively influences the structural power of the public relations practitioners (Porter & Sallot, 2005). In later years, Porter et al. (2007) extended the research subject to the field of blogging, pointing out that the frequent use of blogs does not affect the structural power, expert power or prestige power of public relations practitioners, but that specific use behaviors for the purpose of problem identification and research will increase their expert power (Porter, Trammell, Chung, Kim, 2007). In addition, writing blogs or maintaining blogs can improve the expert power and prestige power of public relations practitioners (Porter et al., 2007).

Recent empirical research shows that the frequent use of social media can increase the structural power, expert power and prestige power of public relations practitioners (Diga & Kelleher, 2009). However, the previous studies have not elaborated on the specific mechanisms of how social media influence the social power of public relations practitioners. Therefore, in the causal-effect framework of employees' public social

media use, social power variables can be used as both outcome variables and mediator variables. Ngai et al. (2015) pointed out that the specific analysis of the possible consequences of a certain type or all types of social power, as an antecedent variable, and the use of social power as a mediating or moderating variable to reveal specific impact mechanisms, is supposed to be the direction that social media research should focus on. The following questions still require clear answers from future studies: Whether the social power of employees in the organization affects the frequency, purpose and specific use behaviors of social media and how it affects the likely outcomes? Whether the use of social media by employees affects their perception of supervisor social power, especially coercive power and expert power, and how it also affects the resulting outcomes, such as attitudes and behaviors towards superiors and organizations? How does social power act as a mediating or moderating variable to explain the impact and mechanism of employee social media usage on relevant outcome variables?

4.2.3 Organizational culture

In terms of public social media use by employees, organizational culture refers to a system of shared values, beliefs, rituals and symbols that help individual employees interact with people in the organization, organizational structures and organizational functioning to produce behavioral norms about their use of public social media (Lund, 2003; Razmerita, Kirchner, & Nielsen, 2016). Each organization has its own unique culture, which includes visible and invisible characteristics. The former involves the value, mission and philosophy that the organization has long embraced, while the latter involves the norms and values that guide employees' behaviors and actions (Razmerita et al., 2016). Organizational culture has been widely recognized as an important factor affecting the adoption of information systems (Razmerita et al., 2016; Fusi & Feeney, 2018), possessing a non-negligible influence on employee usage behaviors of ICTs (Hislop & Axtell, 2011; Derks, van Mierlo, & Schmitz, 2014; Martin, Parry, & Flowers, 2015). The ICTs use by employees after working hours and its effects may vary due to differences in organizational culture (Boswell & Olson-Buchanan, 2007). When organizational culture advocates long working hours and high-intensity work

dedication, employees may be inclined to show more voluntary work-related technology use behaviors during non-working time (Schlachter, McDowall, Cropley, & Inceoglu, 2018). Soylu & Campbell (2007) pointed out that the use of advanced technology in workplaces will increase the physical and emotional stress of employees, and organizational culture may play a significant role in this process. In organizations that advocate an always-on culture, smartphone usage of employees may be more likely to cause work-family interference (Derks, van Duin, Tims, & Bakker, 2015). When organizational culture has a low impact on the integration of work and personal life, employees' work-life integration preferences can alleviate the impact of work-related PC/laptop use on work-family conflicts after work (Gadeyne, Verbruggen, Delanoeije, & De Cooman, 2018).

Recent research suggests that organizational culture will affect employees' use of enterprise social media. Treem, Dailey, Pierce and Leonardi (2015) emphasized that future research should consider the impact of unique elements of organizational culture on employees' perceptions and expectations, when discussing how to build the expectation framework for enterprise social media. Waheed, Anjum, Rehman and Khawaja (2017) found that culture may affects users' social networking behavior based on a systematic analysis of 116 research papers about social networking sites. Nkwe and Cohen (2017) systematically analyzed 27 papers which investigated the impact of SNS on psychological and behavioral outcomes in the workplace, establishing how social networking sites affect social support construct, such as self-esteem and sense of belonging of the employees, and whether culture influences this relationship. Specifically, organizational culture affects the preferences of organizations and employees for ICTs. Evidence suggests that organizations that prefer to use email and teleconferencing to communicate prevents employees from adopting and using corporate social media (Chin, Evans, & Choo, 2015). Organizational culture positively influences employees' adoption of enterprise social software by influencing perceived usefulness and ease of use (Antonius, Xu & Gao, 2015). The culture which advocates knowledge sharing within the organization promotes the use of corporate social media (Vuori, & Okkonen, 2012). At the effect level, organizational culture gives employees

enough time and space to use corporate social media to build and develop new relationships, which helps to strengthen employees' social capital, thereby improving their innovation performance and routine performance (Ali-Hassan, Nevo, & Wade, 2015). Organizational culture may also affect the knowledge exchange quality of corporate social media (Beck, Pahlke and Seebach, 2014).

However, there are few studies directly examining the role of organizational culture on employee use of public social media and its effects. Only Fusi and Feeney (2018) have investigated how three dimensions of organizational culture, innovativeness, centralization and routineness, affect government employees' attitudes towards social media use in the workplace, while Van Puijenbroek et al. (2014) examined the moderating role of the dialogue culture of an organization against the relationship between social media use by employees and work-related learning. Social media use has the potential to change organizational practices and culture (Olsson & Eriksson, 2016), for instance, developing a cooperative culture within an organization (Silic & Back, 2016). Scholars have gradually realized the importance of organizational culture and called on researchers to conduct relevant investigations in future research. Sigala & Chalkiti (2015) speculated that a rigid and closed organizational culture may influence the use of social media and the role of social media in employees' creativity when exploring the influence of employees' use of social media for knowledge management and creativity. Batenburg & Bartels (2017) inferred that organizational culture may be an important variable in explaining employees' social media boundary management behavior.

Therefore, several important issues deserve further investigation: How does organizational culture affect employees' work-related and non-work-related public social media usage, and how does it affect job-related public social media usage of the employees after work? How does organizational culture predict employees' comments about work on public social media? How do the different dimensions of organizational culture explain the relationship between employees' public social media usage behavior and outcome variables? How do different organizational cultures affect employees' choice of public social media and specific use behaviors? How does organizational

culture ease the relationship between social media use and work-family conflicts?

4.2.4 Employee health

The impact of employees' use of public social media on their health is worthy of more attention. The reason for little attention in this field to date may be attributed to the following: on the one hand, compared to the consequences which are closely related to organizational development, such as job performance, employee health is often considered as a personal consequence. For example, Moqbel & Kock (2018) took job performance as a work-environment-level consequence, but employee health as a personal environment-level consequence when they investigated the dark side of employees' use of SNS. On the other hand, studies about employee's use of public social media are still in their infancy, and scholars thus far have contributed most effort on unveiling the effects of employees' public social media use on the consequences that may tightly affect organizational development.

However, ICTs have become an important part of organizational life, not only reshaping how organizations are structured, and their culture at the macro level, but also changing the workflow and work patterns at the micro level (Boswell & Olson-Buchanan, 2007; Butts, Becker, & Boswell, 2015; Gadeyne et al., 2018). The diversity of social media functions not only helps employees complete work at any time and from anywhere, according to their personal preferences, but also enables managers to assign work tasks to employees whenever and wherever (van Zoonen et al., 2016; Xie et al., 2018). Employees' work-related social media use, after working hours, thus becomes commonplace (Xie et al., 2018). The boundaries between work and family, as well as work and life, are blurring (Derks et al., 2015; Wright et al., 2014). The role of boundaries is to structure and distinguish between the various roles that individuals undertake in different fields (Boswell & Olson-Buchanan, 2007). ICT induces these blurred boundaries and employees with boundary separation preferences encounter significant challenges in work-life conflicts, as well as work-family conflicts (Derks et al., 2016). This kind of work-family conflict manifests itself against at least two aspects: firstly, due to scarcity of time, organizing employees to work overtime will reduce their time with their family; secondly, employees will extend their work stress to family life,

hindering their self-regulation and recovery, thereby affecting their fulfillment of family roles (Gadeyne et al., 2018). Empirical studies have shown that work-related ICT use, in non-working hours, will cause work-family conflicts and work-life conflicts (Boswell & Olson-Buchanan, 2007; Fenner & Renn, 2010; Wright et al., 2014; Derks et al., 2015; Gadeyne et al., 2018).

Work-related social media use, after working hours, has the potential to impair the physical and mental health of employees by inducing work-family conflicts. Both the cross-sectional and longitudinal data indicate that work-family conflicts negatively affect employee health (Frone, Russell, & Cooper, 1997; Grzywacz, & Joseph, 2000; Allen & Armstrong, 2006; Van Steenbergen & Ellemers, 2009; Kim & Cho, 2017). The mechanisms for this negative impact are as follows. On the one hand, since family and job roles are the core elements of adult identity, work-family conflict will lead to greater psychological stress, while long-term experiences of such stress will impair immune system functionality and exacerbate heart disease (Van Steenbergen & Ellemers, 2009). On the other hand, work-family conflicts influence employee health by changing their specific behavior. Studies have evidenced that employees who experience work-family conflicts often eat lots of junk food which may make people gain weight and do less physical exercise, leading to the deterioration of physical health (Allen & Armstrong, 2006).

Meanwhile, excessive use of social media at work by employees will also do harm to personal health. This behavior can be divided into three types, namely excessive social use, excessive recreational use and excessive cognitive use (Cao & Yu, 2019). Cao & Yu (2019) proved that excessive cognitive use increases employees' strain through enhancing their perceptions of information overload (Cao & Yu, 2019). The increasing stress will make employees experience various negative emotions, such as anger (Jang & Johnson, 2003). The relationship between negative emotions and health has been widely confirmed (Consedine & Moskowitz, 2007). It is reasonable to argue that employees' excessive use of social media at work may negatively influence their physical and mental health by inducing negative emotions.

To summarize, the use of public social media by employees may impact physical

and mental health through different mechanisms. However, only Moqbel & Kock (2018) directly studied this effect, finding that social media addiction promotes positive emotions and thus further improves health. Further studies should attach great importance to the association between public social media use by employees as well as their physical and mental health. Furthermore, scholars should systematically clarify the negative effect and potential path of employees' public social media use on their health.

5 Conclusion

This study constructs a causal-chain framework for research exploration into employees' usage of public social media platforms by systematically analyzing the antecedent variables, mediators, moderators and outcome variables used in 59 quantitative papers. At the same time, this study analyzes currently-published theories and models used in research, from four aspects: (1) personal behavior theories, (2) social behavior theories, (3) organizational behavior theories and (4) mass communication theories.

The contributions of this research are as follows: Firstly, through the analysis of 59 quantitative papers, a theoretical basis and model of studies related to the use of public social media by employees is established. The representative theories are Social Capital Theory, Job Demands-Resources Model, Boundary Theory, Media Synchronicity Theory, Social Cognitive Theory, Technology Acceptance Model, Self-Determination Theory, and Media Richness Theory. Secondly, based on previous literature, this study systematically proposes a causal-chain framework for study into employees' usage of public social media platforms, which provides a research map for the development of relevant studies in the field. For example, this study finds that researchers mainly used use behaviors of employees rather than social factors, as antecedents. Meanwhile, in relation to outcome variables, more attention is paid to variables such as job performance and job satisfaction, which reflect work outcomes and attitudes towards an organization or work, while the impact of employees' public social media use on their physical and mental health is studied less frequently. In terms of moderators, variables such as use behavior, user characteristics, and job

characteristics receive most attention. With regards to mediators, social capital, job satisfaction, and work conflict are most significant. This study finds that few studies identify that the organizational culture factor has an important impact on employees' work attitudes, behaviors and job outcomes in the organizational context. Thirdly, this study proposes future directions for research into employees' usage of public social media platforms, including topics relating to platform attributes, social power, organizational culture and employee health.

Nevertheless, this study may have some limitations. Firstly, referring to existing research, it only uses 59 quantitative journal articles relating to public social media. Although these papers can reflect the research situations in the field, they do not provide a full-sample analysis. Future study could consider adding high-quality conference papers and good-quality papers from other databases, such as Emerald Management eJournals and Ebscohost's Business Source Premier to the research sample. Secondly, research interest into the influence of social media on the organization is still in a period of rapid growth, and the related research will also grow rapidly in the next few years. Future research should add these papers to the study samples. Thirdly, social media platforms are constantly evolving with advancements in technological functionality, and new social media may emerge in the future. Future research should include these as part of the literature search.

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