Identifying the combinations of motivations and emotions for creating satisfied users in SNSs: An fsQCA approach

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ABSTRACT

Social Networking Sites (SNSs) play an important role in our daily lives and the number of their users increases regularly. To understand how users can be satisfied in the complex digital environment of SNSs, this study examines how motivations and emotions combine with each other to explain high satisfaction. Users' motivations comprise four attributes, entertainment, information, social-psychological, and convenience. Emotions are divided into their two main categories, that is positive and negative emotions. We draw on complexity and configuration theories, present a conceptual model along with propositions and perform a fuzzy-set qualitative comparative analysis (fsQCA). Through an empirically study with 582 SNSs users, we present eight combinations (configurations) of motivations and emotions that lead to high satisfaction, which highlight the role of high convenience, followed by entertainment and information motivations in being satisfied with SNSs. High satisfaction can be achieved both when positive and negative emotions are high and low, depending on how they combine users' motivations. None of the factors are indispensable to explain high satisfaction on their own, instead they are insufficient but necessary parts of the causal combinations that explain high satisfaction. This study contributes in SNSs literature by extending current knowledge on how motivations and emotions combine to increase satisfaction, and by identifying specific patterns of users for whom these factors are important and influence greatly their satisfaction.

1. Introduction

The use of Social Networking Sites (SNSs), such as Facebook, Snapchat, Instagram, is part of many people's daily activities. People spend a lot of time sharing personal information, communicating with friends, or using them as tools to improve their work. The overall number of SNSs' users increases regularly (eMarketer, 2017), however, not all platforms experience an equivalent increase in their user base, some show accelerated growth, like Snapchat (Carson, 2017), and others show a decline in market share, like Twitter (eMarketer, 2016). This is due to intense competition among SNSs, as they always aim to offer improved and new services, but also due to the fact that users evolve and may develop different needs, motivations, and emotions, thus seeking different experiences (Chung & Buhalis, 2008; Kapoor et al., 2018; Krishen, Berezan, Agarwal, & Kachroo, 2016). SNSs are highly experiential, their value is created through users' interaction with them, transforming the way people communicate and creating new online communities with large impact on business and society

(Dwivedi et al., 2018). There are numerous studies in the area of SNSs usage and satisfaction, with many of them examining technical and interface characteristics (Alalwan, Rana, Dwivedi, & Algharabat, 2017; Kim, Kim, & Nam, 2010; Kim, Sohn, & Choi, 2011). Our case proposes a different approach to satisfaction focusing on internal factors as predictors of SNSs usage. Users' needs and motivations are influenced by the system they are using (Au, Ngai, & Cheng, 2008; Punyanunt-Carter, De La Cruz, & Wrench, 2017), thus we view them as individuals with motivations and emotions, which in turn can affect their satisfaction with SNSs use.

The role of affective perceptions and emotions in influencing user behavior in online services has been largely investigated recently (Bagozzi, Belanche, Casaló, & Flavián, 2016; Pappas, Kourouthanassis, Giannakos, & Chrissikopoulos, 2017). Distinct positive emotions, such as enjoyment or pleasure, may increase users' satisfaction with online services (Kang, Hong, & Lee, 2009). Furthermore, overall positive emotions can be considered as more important than negative emotions in influencing users' behavioral intentions (Pappas, Kourouthanassis,

Giannakos, & Chrissikopoulos, 2014), however negative emotions may occur at the same time and they should be considered as well (Pappas, Kourouthanassis, Giannakos, & Chrissikopoulos, 2016; Penz & Hogg, 2011). Similarly, when someone uses SNSs, may experience different emotions (García-Crespo, Colomo-Palacios, Gómez-Berbís, & Ruiz-Mezcua, 2010), that influence his or her behavior and satisfaction (Krishen et al., 2016). Nonetheless, studies choose to examine specific emotions as predictors of user behavior or satisfaction (Brooks, 2015; Hu, Kettinger, & Poston, 2015; Li, Li et al., 2018). To this end, the critical role of emotions in SNSs, combined with their potential to be transferred via emotional contagion strategies (Kramer, Guillory, & Hancock, 2014), indicate that a holistic approach to the examination of emotions is needed. Users' motivations are critical both in terms of choosing and using SNSs. Previous studies in the area of SNSs usage have examined different aspects of motivations, including their use for entertainment purposes, to receive and share information, for social-psychological reasons, and out of convenience (Chung & Buhalis, 2008; Kim et al., 2011). Also, SNSs usage is motivated by users' needs coupled with their personality traits, which in turn can also influence their emotions (Seidman, 2013). Here, we argue that it is needed to explore the role of motivations and emotions on increasing users' satisfaction, as the latter is a main antecedent of repeated behavior, on which SNSs adoption is based. As SNSs evolve and new types appear continuously, it is needed to understand factors that will lead to satisfied users, and by extension to loyal users.

The majority of studies in the area employ first-generation multivariate methods (e.g., multiple regression analysis) and second-generation multivariate methods (e.g., structural equation modelling (SEM)) which assume that relations between variables are symmetric. For example, studies in the past decade (Bae, 2018; Islam, Mäntymäki, & Kefi, 2019; Kim et al., 2011) have examined users' motivations and needs of SNSs' usage with the help of analyses of variance or SEM in order to explain users' engagement, attitude and behavioral intentions towards SNSs. However, relations among variables in a dataset, as in real life, are quite complex and not always proportional or balanced (Urry, 2005; Woodside, 2017). For instance, users with different motivations and emotions, might not be represented from the one-model-fits-all produced from the traditional regression-based models (RBMs). Indeed, these models suggest that a predictor needs to be both a necessary and sufficient condition to achieve the desired outcome because they assume relations among variables to be symmetric and compute one single best solution that explains the outcome. Focusing on symmetric relations may be misleading, since such effects do not apply to all cases in the dataset, thus the relationship between two variables is unlikely to be of symmetrical form (Ragin, 2008; Woodside, 2014). For example, high convenience may be sufficient to lead to high satisfaction, however if convenience is absent then users may still be satisfied if they have a pleasant experience or they find the information they are looking for. As a consequence, convenience may not be a necessary condition for the outcome, indicating that a different approach is required which identifies asymmetric relations.

To address the gap in the literature, we draw on complexity and configuration theories and seek to capture what causal patters of factors lead to high satisfaction from SNSs use (Lewin, 1999; Woodside, 2017). Inherent in the theories is the principle of equifinality (i.e., multiple complex configurations of the same conditions can explain the same outcome) (Woodside, 2014), and the principle of causal asymmetry (i.e., the causes explaining the presence of an outcome, are likely to be different from those explaining the absence of the same outcome) (Ragin, 2008). Thus, the following research questions are put forth:

RQ1. How do motivations and emotions from SNSs use combine to explain users' high and low/medium satisfaction with SNSs?

RQ2. What conditions of motivations and emotions are sufficient or necessary to create causal combinations that explain high and low/medium satisfaction with SNSs?

To answer the research question we employ a fuzzy-set qualitative comparative analysis (fsQCA) (Ragin, 2008), which can identify the causal combinations of the different types of motivations and emotions that lead to high satisfaction with SNSs. The findings identify eight different combinations of the aforementioned factors that explain the outcome. Neither motivations nor emotions are necessary or sufficient in explaining high satisfaction on their own, instead, their combinations operate together to explain the outcome. Also, the findings show how users with the similar motivations and emotions may have different levels of satisfaction. The paper contributes to existing literature in two main ways. First, it provides empirical evidence on the importance of motivations in satisfied users', and second, it examines the combined influence of motivations (i.e., entertainment, information, social-psychological, convenience) and emotions (i.e., positive and negative emotions) on satisfaction with SNSs.

The paper is organized as follows. In Section 2, the theoretical background on motivations and emotions when using SNSs is presented, followed by a discussion on the conceptual model and research propositions. Section 3 describes the research methodology, and provides details on fsQCA and how it is implemented and Section 4 presents the empirical results. Finally, Section 5 discusses the findings highlighting theoretical, methodological, and practical implications, while Section 6 concludes the paper providing limitations and avenues for future research.

2. Theoretical background and related work

2.1. Motivations when using SNSs

The use of SNSs depends largely on ones' motivations and needs, which in turn, can influence behavior; if these motivations are reached, then the persons is expected to feel satisfied. Uses and gratifications theory (UGT), deals with purposeful media use and suggests that media consumption is influenced by users' goal-directed motivations and examines individuals as active consumers instead of passive receivers (Blumler, 1979; Katz, Blumler, & Gurevitch, 1973). Based on studies in the area that have examined typologies of use and gratifications, there are two basic categories of gratifications: content and process. Content gratifications refers to the fulfillment of information expectation from media content. Process gratifications refers to the fulfillment and pleasure from engaging in communication, that is, using the medium itself rather than the content. Extant studies in the area have used UGT in the context SNSs and media consumption and have identified different factors that can increase users' engagement, overall satisfaction, as well as their attitude and behavioral intentions towards SNSs. Such factors include interpersonal communication, social support, friendship, and intimacy (Islam et al., 2019; Krishen, Berezan, Agarwal, & Kachroo, 2019; Mäntymäki & Islam, 2016), entertainment and self-expression (Hsu, Chang, Lin, & Lin, 2015; Krause, North, & Heritage, 2014; Liu, North, & Li, 2017), cognitive and affective perceptions (Ha, Kim, Libaque-Saenz, Chang, & Park, 2015; Li, Guo, & Bai, 2017), and informational value (Islam et al., 2019; Li, Guo, Bai, & Xu, 2018).

Indeed, UGT suggests that the use of SNSs is based on and motivated by users' inner needs (Raacke & Bonds-Raacke, 2008). Motivations include socializing, entertainment, seeking information, psychological, and hedonic motivations (Chung & Buhalis, 2008; Kim et al., 2011; Krishen et al., 2016; Shareef, Mukerji, Alryalat, Wright, & Dwivedi, 2018), and are related to the potential benefits that SNSs may offer to their users by covering their needs (Chung & Buhalis, 2008) and users' intention to participate in SNSs' interactions (Allam, Bliemel, Spiteri, Blustein, & Ali-Hassan, 2019; Kamboj, Sarmah, Gupta, & Dwivedi, 2018; Wamba, Bhattacharya, Trinchera, & Ngai, 2017). People use SNSs for different reasons, such as to find their friends and to communicate with them in a convenient and simple way, which may lead to a feeling of belongingness, encouragement and companionship (Kim et al., 2011). Also, by using SNSs, overtime, they are likely to make new

acquaintances and create new relationships based on similar interests and preferences (Kim et al., 2011). In addition, individuals may use SNSs to seek information, on multiple occasions that might be from news, to travelling information (Kourouthanassis, Mikalef, Pappas, & Kostagiolas, 2017), or to seek social and psychological benefits, which may be gained as people use SNSs over time (Chung & Buhalis, 2008). Since the fulfillment of users' motivations and needs is an important factor in increasing satisfaction, further work is needed to provide an integrated view of SNSs by employing new methods that are able to give more insight into the area.

2.2. Emotions when using SNSs

Emotions are a multidimensional factor, thus, examining different types of emotions is needed in order to capture their complexity (Scherer, Shuman, Fontaine, & Soriano, 2013). Studying together positive and negative emotions, which are likely to coexist, may provide better understanding about their role on increasing satisfaction and formulation of behaviors (Pappas et al., 2016). Defining emotions and how they can be measured has been a long discussion in the literature, and while several definitions exist they are sometimes mixed or used interchangeably with feelings or affective perceptions (Ekman, 1992; Scherer, 2005; Thoits, 2007). In his seminal work Ekman (Ekman, 1992, 1999) discusses distinct emotions and argues how each emotion is not a single affective state, instead it is a family of affective states with the two general categories being positive and negative emotions. Scherer (2005) created an efficient and simple method with the Geneva Emotion Wheel (GEW) for the self-report of emotional experience. Emotions are categorized by their positive–negative and low power–high power dimensions, with intensity or arousal indicators. The GEW was extended and 20 distinct emotions were included for a comprehensive measurement of emotions (Scherer et al., 2013). They have been used measuring users' emotions in online settings (Pappas et al., 2017) or as a lexicon to construct sentiment features for analyzing online reviews (Du, Rong, Michalska, Wang, & Zhang, 2019).

SNSs can be a fun and enjoyable experience for their users (Sullivan & Koh, 2019) but can also lead to fatigue and create anxiety or depression (Dhir, Yossatorn, Kaur, & Chen, 2018; Dhir, Kaur, Chen, & Pallesen, 2019). This indicates that emotions generated from SNSs' usage play an important role both in users' satisfaction and their overall behavior. Indeed, using SNSs is a highly experiential task, thus various emotions may occur while using them. As in many online services, emotions have a critical role and can influence attitudes and behavioral intentions at different stages (Bagozzi et al., 2016; Pappas et al., 2017). Positive emotions can increase users' satisfaction, while negative ones can decrease it (Kuo & Wu, 2012). Especially in the context of SNSs, affective perceptions have a positive influence on SNSs usage (Xu, Ryan, Prybutok, & Wen, 2012), while ones' feelings can also affect their satisfaction (Chang & Zhu, 2012). Studies focusing on distinct emotions, such as enjoyment, have found them being important antecedents of users' intention to continue using an SNS (Li, Li et al., 2018), and they may increase users' satisfaction with online networks (Kang et al., 2009). Although the link of emotions with satisfaction is inherent and one may lead to the other, or vice versa (Oliver, 2014), most of the studies in the area of online services either do not take into consideration emotions or focus on specific ones.

Different types of emotions appear also in SNSs (Van Zalk, Van Zalk, Kerr, & Stattin, 2011) and therefore, being able to capture, analyze, and explain them will lead to improved services (García-Crespo et al., 2010), suggesting that further research is needed for a deeper understanding of their interactions with users' motivations on SNSs. For example, the convenience and entertainment that SNSs can offer by being pleasant and easy to use (Lin & Lu, 2011), is likely to increase users' intention to adopt them. The latter is directly influenced by users' satisfaction (Shin, 2010), highlighting its importance in forming users' motivation in SNSs. Thus, to explain the complexity that stems from the

combination of users' motivations and emotions existing in SNSs, as in most aspects of our lives, a different approach is needed that builds upon this complexity.

2.3. Complexity and configuration theories

Relations among factors (i.e., causes) are complex and depending on how they combine with each other, both high and low scores of a certain factor may explain high scores of an outcome. Indeed, drawing on complexity theory and the principle of *equifinality*, a result may be equally explained by alternative sets of causal conditions (Fiss, 2007; Von Bertalanffy, 1968; Woodside, 2014). Such conditions may be coalesced in sufficient configurations to explain the outcome (Fiss, 2011; Woodside, 2014). Motivations and emotions are important antecedents of users' satisfaction (Kim et al., 2010; Oliver, 2014; Pérez & Del Bosque, 2015), thus they may interact with each other in various configurations, and as users' needs vary, they may consider different sets of attributes before choosing an SNSs. Although positive emotions have been considered as an essential condition for user satisfaction (Oliver, 2014), positive and negative emotions may co-exist affecting each other (Pappas et al., 2016), thus it is important to examine how the existence of both positive and negative emotions can explain users' satisfaction, and if the presence of motivation may allow users' to overcome the feeling of low positive emotions or high negative emotions. For example, users that seek information or entertainment are more likely to be satisfied with SNSs if the feel happy using them, while at the same time users' may still be satisfied if they felt negative emotions due to the lack of convenience, but they managed to find the information they were looking for. In addition, there is a great number of users that prefer to be informed about the latest news through SNSs as it is convenient, thus it is likely that these users will be satisfied with SNSs if they find the needed information in an easy way. Hence, high satisfaction may be achieved through various ways.

Configuration theory proposes the principle of *causal asymmetry*, which means that the presence or absence of a condition that explains an outcome, depends on the presence or absence of the other conditions (Fiss, 2011). A predictor may have an asymmetric relation with the outcome, meaning that even if one variable is *insufficient* for the outcome to occur, it is still able to serve as a *necessary* condition for the same outcome (Fiss, 2011; Woodside, 2013). In this case, a necessary condition is a variable that is present, at least to a degree, in every configuration that explains the outcome, making it indispensable to the outcome. Although motivations and emotions are predictors of users' satisfaction (Kim et al., 2010; Oliver, 2014), it is not clear how the presence or absence of motivations will influence the presence or absence emotions, and vice versa, the same happens with the presence of high levels of satisfaction. Thus, following the previous examples, alternative configurations may include (i) high levels of information and entertainment motivations, and positive emotions in one configuration, or (ii) high levels of negative emotions, low levels of convenience, and high levels of information motivations. Thus, the same outcome may be influenced either positively or negatively by a specific factor, depending on how it combines with the other factors.

2.4. Conceptual model

Users of SNSs are constantly increasing along with the number of different types of SNSs. Therefore, first, it is important to capture users' needs and motivations related not only to SNSs' usage, but also to users' choice of specific SNSs among many that are available, and second to understand how their satisfaction levels may be increased (Kim et al., 2010; Krishen et al., 2016). This has been previously examined from studies in the area of SNSs' adoption and usage, drawing on the UGT, comparing also how those motivations are different when using traditional media (Kim et al., 2011; Plume & Slade, 2018; Raacke & Bonds-Raacke, 2008). Different motivations have been recognized as

important when using SNSs, including entertainment, information, social-psychological, and convenience, and their influence on users' attitudes and behavior has been verified (Chung & Buhalis, 2008; Kim et al., 2011). Furthermore, considering the fundamental role of satisfaction as a determinant of behavioral intentions (Oliver, 1993, 2014), and the fact that different factors exist that may influence both satisfaction and its effect on behavior, we argue that we need to further explore its relationship with users' motivations (Kim et al., 2010). Additionally, emotions may act as motivators that drive one toward goal-oriented behaviors, thus their role should be examined on how it is combined with motivations in explaining users' satisfaction (Ladhari, Souiden, & Dufour, 2017; Pappas et al., 2016; Wakefield & Wakefield, 2016). Indeed, as SNS use is an ongoing activity previous experiences will influence future use, thus it is likely that emotions generated during past experiences will also influence users' motivations and needs for using an SNS. For example, a user with information motivations may feel angry or sad if the information acquired is not accurate or they are presented with fake news. So, this experience, and the emotions developed, will not only lead to low satisfaction but also are likely to influence their motivations on how they use SNSs in the future. As emotions are linked with user satisfaction, we argue that their inclusion here will offer more insight on this relation and how it is shaped.

Following the previous discussion, we posit that further work is needed to provide a general overview that describes the role of motivations and emotions, and their interrelations to predict high satisfaction with SNSs. Indeed, there are not enough studies in the area of SNSs adoption and use that examine motivations and emotions. In addition, the majority of current studies employ variance-based methods to build integrative models, which assume a symmetric relation between the examined factors. To address this gap, we examine users' satisfaction with SNSs by unravelling configurations of causally related sets of factors. We posit that there is a synergy among motivations and emotions in explaining satisfaction with SNSs, and theorize that there is not one single, optimal, configuration of such values. Instead, multiple and equally effective configurations of causal conditions exist, which may include different combinations of motivations and emotions. Depending on how they combine they may or may not explain users' high satisfaction from SNSs. Satisfaction here is measured with a 7-point Likert scale; thus, high satisfaction means that the respondents' rated their satisfaction levels as 6 or 7 on the scale. From a methodological point of view, *high* satisfaction means that the condition (i.e., satisfaction) is present in the solution. More details are offered in the methodology section. This approach allows the identification of asymmetrical relations among the examined factors and the outcome.

To conceptualize these asymmetric relationships, we present a conceptual model (Fig. 1) showing the examined factors and their intersections. Overlapping areas represent possible combinations among factors, that is areas that one factor may exist together with the rest (e.g., combinations that explain high satisfaction are included within the outcome of interest area). To identify these combinations of factors in a complex system as SNSs, formulating hypotheses framed as correlational expressions, - a common approach in variance-based methods-, does not allow for a holistic approach that allows the identification of multiple solutions. In configuration theory approaches research propositions are formulated as causal recipes to capture the different combinations among factors, and theoretically specify which should be present or absent from the causal recipe (Fiss, 2007; Ragin, 2008).

Based on the above discussion, it is common in studies that employ fsQCA to formulate generic propositions that describe the multiple configurations and asymmetric relations among variables that explain the outcome of interest [e.g., (Pappas et al., 2016)]. In this study we assume that such propositions hold true, and we proceed to formulate specific testable propositions which include configurations that are expected to hold true for a part (small or large) of the sample. This, in addition to identifying all the possible solutions that explain high
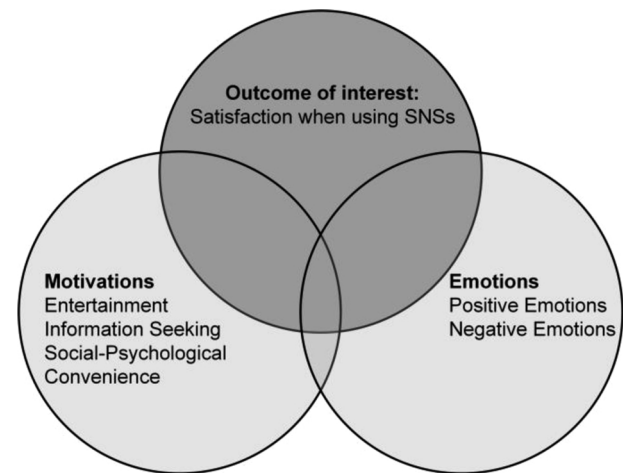

Fig. 1. Venn diagram of the conceptual model explaining satisfaction with SNSs.

satisfaction, we will also identify within the sample specific cases, or persons, (who and how many) that will have high satisfaction depending on specific antecedent conditions (if they are high or low/medium).

A discrepancy between gratifications obtained and gratifications sought may influence users' satisfaction with the medium. For example, if a user who seeks information on social media realizes that this information is inaccurate or fake, is likely to feel emotions of anger, disappointment, or sadness caused from this action while at the same time it will impact the credibility of the medium. In turn, credibility of social media influences motivations for using them; but on the other hand, gratifications obtained from such sources can be that strong so users are willing to trade credibility for their satisfaction (Johnson & Kaye, 2015). In other words, a user may choose to trade credibility for other needs if the medium covers these needs at a satisfactory level. For example, users who seek both information and entertainment, are looking to fulfil different needs, compared to users that seek only information or only entertainment, thus they may be also looking for a different type of SNSs that can cover both needs. Furthermore, entertainment can directly increase process gratification and may indirectly impact loneliness and depression, through process gratification (Li, Guo et al., 2018). Indeed, when users' entertainment gratifications are fulfilled or exceeded based on their expectations their satisfaction will be higher, while a similar discrepancy regarding information gratifications will not influence their satisfaction (Bae, 2018). Furthermore, taking into account the clear role of emotions in forming users' satisfaction (Oliver, 2014) and how different levels (high or low) of positive emotions may influence users' attitudes (Bagozzi et al., 2016; Pappas, 2018), we expect that information and entertainment motivations, when combined, will be able lead to high satisfaction for both high and low/medium positive emotions. These combinations will refer to different users in our sample. Thus, we formulate the following 2 propositions.

Proposition 1. Users' having *high information* motivation, *high entertainment* motivation, and *high positive emotions*, will have *high satisfaction* with SNSs.

Proposition 2. Users' having *high information* motivation, *high entertainment* motivation, and *low/medium positive emotions*, will have *high satisfaction* with SNSs.

As discussed above, fulfilling users' information needs may increase the satisfaction of some users, but, it is likely that more needs may have to be fulfilled for users to be satisfied depending on how they use SNSs. For example, both convenience and information can have a positive effect on user satisfaction with companies' SNSs pages in the hospitality

Table 1
Operational definition of constructs and source in the literature.

Construct	Definition	Source
Entertainment	Using SNSs for entertainment purposes	(Chung & Buhalis, 2008; Kim et al., 2011)
Information Seeking	Using SNSs for seeking information and knowledge	
Social Psychological	Using SNSs for seeking a relationship and involvement with other members	
Convenience	Using SNSs is generally easy and does not require a lot of effort	
Emotions	Measuring users' emotions, based on valence, when using SNSs.	(Pappas et al., 2017; Scherer et al., 2013)
Satisfaction	Users' overall satisfaction with SNSs	(Lu & Hsiao, 2010)

industry (Choi, Fowler, Goh, & Yuan, 2016). However, when refereeing to SNSs in general, recent findings show that convenience does not impact satisfaction for high habitual users, but it is important for low habitual users (Bae, 2018). Furthermore, SNSs can be a fun and enjoyable experience for their users (Sullivan & Koh, 2019). In addition, although positive emotions are likely to lead to high satisfaction, it also depends on the activity and motivation of the user. In detail, excitement can facilitate SNSs use when users are motivated to do something because it is meaningful, however excitement may not be sufficient on its own to motivate the use of SNSs (Wakefield & Wakefield, 2016). Additionally, the use of SNSs without a meaningful purpose but for activities such as passing time or leisure, may increase user's satisfaction with the pleasurable and flexible experience of SNSs use and their satisfaction with the social environment (Li, Guo et al., 2018). The latter, that is users' satisfaction with the social environment, is also affected by their information needs and it may reduce loneliness or depression (Li, Guo et al., 2018), influencing negative emotions. Various social motivations, such us interpersonal communication, social support, friendship, and intimacy (Islam et al., 2019; Krishen et al., 2019; Mäntymäki & Islam, 2016), are expected by definition to have a direct effect on users' satisfaction with SNSs (Kim et al., 2010). Nonetheless, since social and psychological benefits change over time with users becoming more experienced while their needs change or evolve, it is likely that such motivations on their own will not be sufficient to increase their overall satisfaction. Instead, multiple motivations, emotions, and needs may be necessary to be covered to lead to high satisfaction. Thus, we formulate the following 2 propositions.

Proposition 3. Users' having *high information* motivation, *high convenience* motivation, and *high negative emotions*, will have *high satisfaction* with SNSs.

Proposition 4. Users' having *high social-psychological* motivation, *high convenience* motivation, and *high positive emotions*, will have *high satisfaction* with SNSs.

3. Methodology

3.1. Data collection

To explore the propositions, we employed a survey-based research approach. A custom-built online questionnaire was developed, comprising questions on background information of respondents and on the identified constructs using established measurement items as discussed below. We aimed only at experienced and active members of SNSs. The respondents were given a definition of SNSs, followed by a few examples (e.g., Facebook, Snapchat, Instagram, Linkedin) and they were asked to keep this in mind, while answering the questions based on their previous experience. We aimed at about 1800 users of SNSs, out of which 582 responded and had experience with SNSs. They were kindly asked to voluntary fill in an online questionnaire with no reward for their participation.

3.2. Participants

The sample consists of more women (64 %) than men (36 %). The majority of the responders are between 25–34 years old (37 %), 27 % between 18–24, followed by 19 % at the age of 35–44 and 12 % were less than 17 years old. The rest were over 45 years old (5%). In terms of the educational status, the vast majority (50.7 %) were university graduates. Almost all of our sample used SNSs for over a year.

3.3. Measures

The first part of the questionnaire has questions about the demographic profile of the responders (age, gender, education), and the second part had measures of the constructs chosen to be examined as identified in the related work section. For testing the propositions, the survey included reflective scales for the constructs of the conceptual model. Table 1 lists the operational definitions of the constructs in this model, as well as the studies from which the measures were adopted. A 7-point Likert scale anchored from 1 (completely disagree) to 7 (completely agree) was employed. Specifically, in the case of emotions, the approach of Scherer et al. (2013) was adopted, who attempt to understand the semantics of emotions. The users were asked to report their emotions based on their previous experiences when using SNS, while presenting them a few examples of different scenarios that could lead to the creation of emotions with positive or negative valence or with high or low control. This approach has been verified to be appropriate when measuring users' emotions in online settings (Pappas et al., 2017). Here emotions were divided based on valence and verified with an exploratory factor analysis into positive and negative emotions. The Appendix A presents all constructs along with descriptives and loadings.

3.4. FsQCA

Fuzzy-set Qualitative Comparative Analysis (FsQCA) is the combination of fuzzy sets and logic principles with Qualitative Comparative Analysis (QCA) (Ragin, 2000). This method has been applied to examine users' motivations or emotions with SNSs as well as their satisfaction with them (Krishen et al., 2016, 2019; Saridakis, Baltas, Oghazi, & Hultman, 2016; Tran, Pham, & Le, 2019), but also to examine motivations or emotions in e-commerce and e-services (Fang, Shao, & Wen, 2016; Pappas et al., 2016), and can help researchers go beyond the traditional MRAs, as it allows capturing of multiple paths that lead to the same outcome. These paths are combinations of variables, and can include variables as predictors of the outcome only in a small subset of cases, which are usually not identified by MRAs that focus on main effects (Woodside, 2014), but remain important depending on the context. The benefits of configurational analysis and fsQCA mainly occur from the limitations of regression-based methods (Woodside, 2017). Variance based approaches focus on main effects among factors of interest and the variables are examined in a competing environment. The covariance that exists among the variables in a model indicates that the presence or absence of one variable may influence their effect, both on the other variables and on the outcome, supporting the need to apply configurational analysis, which is based on this notion (Fiss, 2007).

The multiple solutions (or configurations) in fsQCA may include both necessary and sufficient conditions, which may appear as present or negated (i.e., not present) on a solution. Also, they may be on a situation that they do not play a role on a specific solution, thus they do not appear at all in the solution. Both necessary and sufficient conditions may be present (or absent) as core conditions, indicating a strong causal relationship with the outcome, or as peripheral conditions, indicating a weaker relationship with the outcome (Fiss, 2011). First, an analysis of necessity is performed, which will identify if any of the causal conditions is a necessary (i.e., indispensable) condition for the presence of satisfaction (i.e., high satisfaction). Necessity, from a set theory approach, means that a condition is a superset of the outcome (Ragin, 2008), thus for each case in the sample, the fuzzy-set membership score of the outcome is smaller than the fuzzy-set membership score of the causal conditions. For a condition to be necessary, its consistency should exceed the threshold of 0.9 (Schneider & Wagemann, 2010). Consistency is the degree to which the cases in the sample that share a causal condition or configuration agree in displaying the focal outcome (Ragin, 2008).

3.4.1. Data calibration

One of the most important steps in fsQCA is data calibration. During this step the researcher needs to transform (i.e., calibrate) all values of the factors into fuzzy sets, with a value range of 0–1 (Ragin, 2008). Data calibration can be either direct, during which the researcher chooses three qualitative thresholds as anchors to calibrate all the values, or indirect, during which the factors are calibrated following qualitative assessments. Either method can be chosen, depending on the data, the underlying theory, and the experience of the researcher (Ragin, 2008). In the direct method, the three qualitative thresholds correspond to full membership, full non-membership and intermediate membership, representing the degree that a case is part of a set (Ragin, 2008). The most straightforward way to calibrate the data is to choose as breakpoints the values of 1, 0.5, and 0. However, when using fsQCA software for the calibration the values follow a logarithmic transformation with the breakpoints for full-set membership and full-set non-membership being 0.05 and 0.95 are used instead of 0 and 1 because the log-odds transformation is not capable of producing memberships that are exactly equal to 0 or 1. More details can be found on Ragin (2008: 86–94). In fsQCA, cases exactly on 0.5 are dropped from the analysis which makes it difficult to analyse the conditions that are set exactly on 0.05 (i.e., intermediate-set membership) (Ragin, 2008). To overcome this issue, Fiss (2011) suggests adding a constant of 0.001 to the causal conditions below full membership scores of 1. To do this, one can add 0.001 in all conditions after the calibration has been done. Here we perform direct calibration, and the survey scale (7-point Likert scale) is used to choose the thresholds following previous studies (Ordanini, Parasuraman, & Rubera, 2014; Pappas et al., 2016). Thus, the full membership threshold is fixed at the value of 6; the full non-membership threshold is fixed at the value of 2; and, the crossover point was fixed at the value of 4.

3.4.2. Obtaining solutions

Here, "solution" describes a combination of conditions that is supported by a high number of cases, where the rule "the combination leads to the outcome" is consistent. To this end, after the calibration, the researcher runs the fuzzy set algorithm in the fsQCA software, which computes a truth table of 2^k rows (k is the number of predictors and each row represents every possible combination). The truth table includes all possible combinations and presents the frequency for each one (i.e., number of observations for each combination). This means that it is expected many combinations to have a frequency of zero. Also, the consistency is presented in the truth table for each combination. Consistency refers to the degree to which cases correspond to the set-theoretic relationships expressed in a solution (Fiss, 2011; Ragin, 2008). Next, the researcher needs to sort the table based on frequency and consistency values. In detail, to assure a minimum number of

observations for the assessment a frequency threshold should be set. This threshold should be 3 or higher for large samples, or could be set at 2 for smaller samples (< 100) (Fiss, 2011; Ragin, 2008). Here, the frequency threshold is set at 3, and all combinations with smaller frequency are removed from further analysis. Also, a threshold for consistency should be set is set at over the recommended value of 0.75 (Ragin, 2008). It should be noted that a low consistency threshold leads to the identification of more necessary conditions, reducing type II errors (i.e., false negatives), but increasing type I errors (i.e., false positives), and vice versa (Dul, 2016). Here consistency threshold is set at 0.85. This defines which combinations fully explain the outcome; the ones above the consistency threshold fully explain the outcome so the value on the outcome column is set at 1, while for the rest is set at 0.

FsQCA offers three sets of solutions (i.e., complex, parsimonious, intermediate) that need to be interpreted by the researcher. The complex solution presents all combinations of conditions when logical operations are applied, and is simplified into parsimonious and intermediate solutions, as they are simpler to interpret (Mendel & Korjani, 2012). Here, we present the intermediate solution which is part of the complex solutions and includes the parsimonious solution. This allows to identify both core and peripheral conditions in the solutions; the ones that are part of the parsimonious solutions are core conditions, with the rest that appear only in the intermediate being the peripheral ones (Fiss, 2011). More details along with a mathematically oriented description of counterfactual analysis may be found on Mendel and Korjani (2012).

4. Findings

4.1. Measurements

First, all constructs are assessed for reliability using Cronbach alpha and Composite Reliability indicators, which show acceptable indices of internal consistency as all are over the threshold of 0.70. Regarding construct validity, the average variance extracted (AVE) should exceed 0.50, the correlations among variables need to be lower than 0.80 points, since this would indicate low discrimination, and the square root of each construct's AVE should be higher than its correlations with the other constructs (Fornell & Larcker, 1981). Here, the AVE ranges between 0.57 and 0.84, all correlations are lower than 0.80, and the square root AVEs are larger than the corresponding correlations. The data do not follow a normal distribution, therefore, Kendall's tau test is employed to measure correlation, as it offers a better estimate of the corresponding population parameter, and its standard error is known, thus is preferred over Spearman's rho (Howell, 2012). The findings are presented in Table 2.

Furthermore, we test for multicollinearity, as well as for potential common method bias by utilizing the common latent factor technique and the CFA marker variable technique, which are preferred from other control procedures (e.g., Harman's single factor test) (MacKenzie & Podsakoff, 2012). Variance inflation factor (VIF) for all factors is lower than the recommended value (< 3), thus multicollinearity is not an issue. Common method bias is not a problem, as variance from the common latent factor technique and the CFA marker variable technique, is 0.11 and 0.26, respectively.

4.2. FsQCA findings

4.2.1. Analysis of necessity

The findings from the analysis of necessity are presented in Table 3. We test for necessary conditions both for the presence of satisfaction (high satisfaction) and for its negation (i.e., not high satisfaction or low/medium satisfaction). In detail, for high satisfaction the consistency values range between $0.32 - 0.85$, for both the presence and negation of the causal conditions. Because none of the causal conditions exceeds the value of 0.9 (Schneider & Wagemann, 2010) they are

Table 2

Descriptive statistics and correlations of latent variables.

Construct	Mean (S.D.)	CR	AVE	1	2	3	4	5	6	7
1. Entertainment	4.10 (1.49)	.82	.53	**.73**						
2. Information Seeking	4.64 (1.57)	.92	.74	.27	**.86**					
3. Social Psychological	3.11 (1.22)	.87	.64	.34	.18	**.80**				
4. Convenience	4.75 (0.91)	.91	.70	.39	.33	.45	**.84**			
5. Positive Emotions	3.51 (1.38)	.93	.61	.44	.33	.48	.40	**.78**		
6. Negative Emotions	2.16 (1.64)	.93	.57	− .02	.04	.14	− .01	.19	**.76**	
7. Satisfaction	4.44 (1.64)	.94	.78	.39	.38	.43	.61	.53	− .14	**.89**

Note: Diagonal elements (in bold) are the square root of the average variance extracted (AVE). Off-diagonal elements are the correlations among constructs (all correlations higher than 0.1 are significant, p < 0.01;). For discriminant validity, diagonal elements should be larger than off-diagonal elements. CR; Composite Reliability.

Table 3

Analysis of necessity for the presence and negation of satisfaction from SNSs.

	Satisfaction		~ Satisfaction	
Causal Conditions	Consistency	Coverage	Consistency	Coverage
Entertainment	.72	.84	.62	.45
~ Entertainment	.52	.68	.78	.64
Information Seeking	.81	.77	.69	.41
~ Information Seeking	.38	.66	.62	.67
Social Psychological	.45	.92	.37	.46
~ Social Psychological	.74	.65	**.94**	.52
Convenience	.85	.81	.65	.38
~ Convenience	.32	.59	.69	.80
Positive Emotions	.58	.92	.43	.43
~ Positive Emotions	.64	.64	**.92**	.58
Negative Emotions	.53	.67	.64	.51
~ Negative Emotions	.62	.73	.59	.44

Table 4

Combinations that lead to high satisfaction when using SNSs.

	Solutions for the presence of Satisfaction							
Condition	1	2	3	4	5	6	7	8
Motivation								
Entertainment	•			●	●		●	•
Information seeking	●	●	●		●			•
Social Psychological		⊗		⊗	⊗	⊗	•	⊗
Convenience	●	●	●	●		●	●	
Emotions								
Positive			⊗	⊗	⊗	⊗		●
Negative			⊗	⊗	⊗	●	●	•
Consistency	.92	.89	.93	.91	.93	.86	.95	.95
Raw Coverage	.59	.56	.36	.41	.29	.29	.28	.25
Unique Coverage	.05	.03	.02	.03	.01	.01	.02	.01

Overall Solution Consistency	0.86
Overall Solution Coverage	0.80

Note: Black circles (●) indicate the presence of a condition, and circles with "x" (⊗) indicate its negation.

Large circles indicate core conditions, and small ones represent peripheral conditions. Blank spaces indicate that a condition may be either present or absent.

considered as necessary for high satisfaction from SNSs. Thus, we proceed with the fuzzy set analysis to identify sufficient combinations of causal conditions that explain high satisfaction. On the other hand, for low/medium satisfaction low levels of social psychological motivations and low levels of positive emotions are considered as necessary conditions since they have consistency values over 0.9 (see negation of social psychological motivations and positive emotions in Table 3). These findings imply that users without high positive emotions or high psychological motivations will have low levels of satisfaction with SNSs. Also, the coverage scores of the two necessary conditions indicate that these factors can be considered *nontrivial*, as they have high coverage scores (i.e., 0.50 and above). Nontrivial necessary conditions are those that exert some constraint on the outcome, while trivial conditions are the ones that are strongly present in most cases (i.e., high consistency) whether they display the outcome or not (i.e., low coverage) (Ragin, 2006). Next we proceeding to test for sufficient conditions.

4.2.2. Analysis of sufficiency for high satisfaction

The findings from the fsQCA on the configurations for high satisfaction when using SNSs are presented in Table 4. Every combination in the solution is able to explain the same outcome at a specific amount. Conditions (core or peripheral) may be either present, negated, or absent with no influence on the solution. Consistency values are presented in Table 4 for each solution as well as the overall solution, with all values being higher than the recommended threshold (> 0.75). Consistency shows the degree that a relationship has been approximated, and coverage evaluates the empirical relevance of a consistent subset (Ragin, 2006). The overall consistency is similar to the correlation showing how strong is the solution, and the overall solution coverage indicates the extent to which high satisfaction may be determined from the existing configurations, and is comparable to the R-square value reported in traditional regression analyses. The overall solution coverage of 0.80 shows that a large amount of the outcome is explained by

the eight solutions. Furthermore, fsQCA computes the empirical relevance for each solution, by calculating raw and unique coverage. The raw coverage describes the amount of the outcome that is explained by a certain alternative solution, while the unique coverage describes the amount of the outcome that is exclusively explained by a certain alternative solution. The solutions presented in Table 4 explain a great number of users' satisfaction with SNSs, ranging from 25 % to 59 % cases associated with the outcome.

For high satisfaction when using SNSs, solutions 1–8 present combinations for which the examined factors may be present or absent, depending on how they combine with each other. In detail:

Solutions 1, 2: Users have high satisfaction from SNSs, when they have high entertainment or low/medium social-psychological motivation, and at the same time they have high information and high convenience motivation, regardless of any emotions one may feel. This highlights the importance of information seeking behavior and convenience in SNSs usage, and describes users that most likely prefer to use SNSs to receive news out of convenience. The findings show that when this is achieved then the users are overall satisfied. These solutions explain high satisfaction with SNSs of 59 % and 56 % of the users, respectively.

Solution 3: Users that have low/medium levels on emotions (both positive and negative), will have high satisfaction with SNSs if they have high information and convenience motivation. Similar to solutions 1 and 2, this finding verifies the important role of information and convenience when using SNSs. Indeed, this finding describes similar type of users that receive information via SNSs as it is easy and requires

no significant effort, but most likely have not developed any strong emotions towards SNSs usage. The solution explains 36 % of the SNSs users. It is interesting to note, that although in all solutions 1–3 information and convenience are very important and are present as core factors, in all of the solutions they are combined with at least one other factor to explain satisfaction, thus verifying the asymmetric relations.

Solution 4 and 5: Users with low/medium emotions and low social psychological motivations, will have high satisfaction if they are using SNSs for entertainment and information or because it is convenient. This solution describes people that use SNSs in order to relax and forget about work or other things, and to receive information, or because it is just easy. In such cases, the findings show that users who have low/ medium emotions can still feel highly satisfied from SNSs. The comparison of this solution with solution 3, hints to the relation of information motivations with low levels on both positive and negative emotions. It is likely that users' who mainly use SNSs to receive information may not develop high positive nor negative emotions. The solution explains 41 % of the sample.

Solutions 6 − 8: Finally, for users that have high levers on one or both emotions, satisfaction may be achieved when combined with (i) high convenience with low/medium social-psychological motivations and low/medium positive emotions (Solution 6), (ii) high entertainment, high convenience and high social-psychological motivations (Solution 7), or last by (iii) high entertainment, high information, with low/medium social-psychological motivations (Solution 8). These solutions are of high interest as they provide combinations of factors on which negative emotions are high. Thus, users that have developed negative emotions (e.g., disappointment, sadness) when using SNSs, they are likely to be satisfied if they use them out of convenience and entertainment, or if they also experience high positive emotions. In the last case, positive emotions may dominate over negative ones. These solutions explain high satisfaction with SNSs of 29 %, 28 %, and 25 % of the users, respectively.

Next, we test the specific propositions to identify how the defined configurations explain the outcome of interest (i.e., high satisfaction with SNSs), and especially for which cases and for how many in our sample (Pappas, 2018). This is done by computing the specific configuration in fsQCA software, and plotting it against the outcome of interest. The process on how to compute a specific configuration is similar to predictive validity (see next section). In the plots, "*" means *and*, "~" means *not*.

Fig. 2 presents the fuzzy XY plots for testing propositions 1–4 with the highlighted cases representing persons in the sample for which their satisfaction with SNSs can be either high or low. In detail, findings show 50 persons with high information motivation, high entertainment motivation, and high positive emotions (scores over 0.7), out of which only 39 have high satisfaction with SNSs (scores over 0.80). Thus, proposition 1 includes only 50 cases, but 39 out of 50 will have high satisfaction with SNSs (upper right corner in the plot). Next, regarding proposition 2, the findings show that out of the 24 persons with high information motivation, high entertainment motivation, and low/ medium positive emotions, only 8 of them will have high satisfaction with SNSs. Proposition 3 includes 50 cases (persons with high information motivation, high convenience motivation, and high negative emotions,), but 30 out of 50 will have high satisfaction with SNSs (upper right corner in the plot). Lastly, regarding proposition 4, out of the 33 persons having high social-psychological motivation, high convenience motivation, and high positive emotions, only 27 will also have high satisfaction with SNSs.

These configurations (or models) do not correspond to a specific solution identified by fsQCA, instead they allow us to capture specific cases, or persons (who and how many), within the sample that will have high satisfaction with SNSs, depending on specific antecedent conditions (if they are high or low/medium) (Pappas, 2018). Indeed, the asymmetric analysis shows that high scores on a configuration usually occur for high scores on the outcome condition, making the

configuration useful for researchers. However, a configuration does not predict all cases with high scores on the outcome, as was the case for the four propositions, since other configurations exist that can predict high scores for the same outcome (i.e., the upper left side in the plot). Configurations with consistency larger than 0.80 are useful and may be used for advancing theory (Woodside, 2017).

4.2.3. Analysis of sufficiency for low/medium satisfaction

Finally, we also tested for the negation of satisfaction (i.e., the low/ medium satisfaction). The results in Table 5 show an overall solution coverage of 0.65 for low/medium satisfaction suggesting that a substantial proportion of the outcome is covered by the four solutions. Comparing the findings between high and low/medium satisfaction shows that configurations of motivations and emotions that explain high satisfaction are no mirror opposites of configurations for its negation, in line with the principle of causal asymmetry. Furthermore, the findings show that the combination of low levels of motivations and positive emotions or high levels of negative emotions will lead to low/ medium satisfaction. In detail, low levels of social-psychological motivations and convenience are always part of the solutions that lead to low satisfaction, however they are not sufficient on their own. More specifically, they are combined with low information seeking motivation and low positive emotions (solution 1) low entertainment motivation and low positive emotions (solution 2); low positive emotions and high negative emotions (solution 3) and low information seeking and entertainment motivations and high negative emotions (solution 4).

4.3. Predictive validity

This study performs predictive validity testing to examine if the model is able to predict equally well high satisfaction on a different sample (Pappas et al., 2016; Woodside, 2014). Predictive validity is important to be tested because a good fitted model may not always predict the outcome as well as it is expected, however it is not common to be tested in related literature. For predictive validity testing, first, the sample is divided randomly into a subsample and a holdout sample. Next, we performed the same fsQCA analysis with the whole sample, but this time, only for the subsample. Then, these findings (Table 5) are tested against the holdout sample. In both cases, the samples need to explain well the outcome at a similar level. Details and instructions on how to perform predictive validity can be found on Pappas, Giannakos, and Sampson (2019).

Table 6. shows that the patterns of complex antecedent conditions are consistent indicators of high satisfaction for the subsample, with overall solution consistency and coverage 0.85 and 0.77, respectively. Every solution in Table 6 represents a model that then should be plotted against the outcome variable (Fig. 3). The findings for testing model 1 against high satisfaction indicate high consistency (0.97) and coverage (0.44). Predictive tests for all models suggest that the highly consistent models for the subsample have high predictive ability for the holdout sample and vice versa, for high satisfaction. All results are available upon request.

5. Discussion, implications, and future work

The use of SNSs and the satisfaction that derives from it depends on users' motivations and emotions. Here, we argue that different combinations (or configurations) of motivations and emotions can explain users' satisfaction from SNSs. To identify such combinations, we build on complexity and configuration theories and propose a conceptual model that includes four users' motivations (i.e., entertainment, information, social psychological, convenience) and their emotions (positive and negative). The results identify multiple combinations that explain high satisfaction with SNSs, offering two main contributions. First, we identify the critical role of motivations when using SNSs over
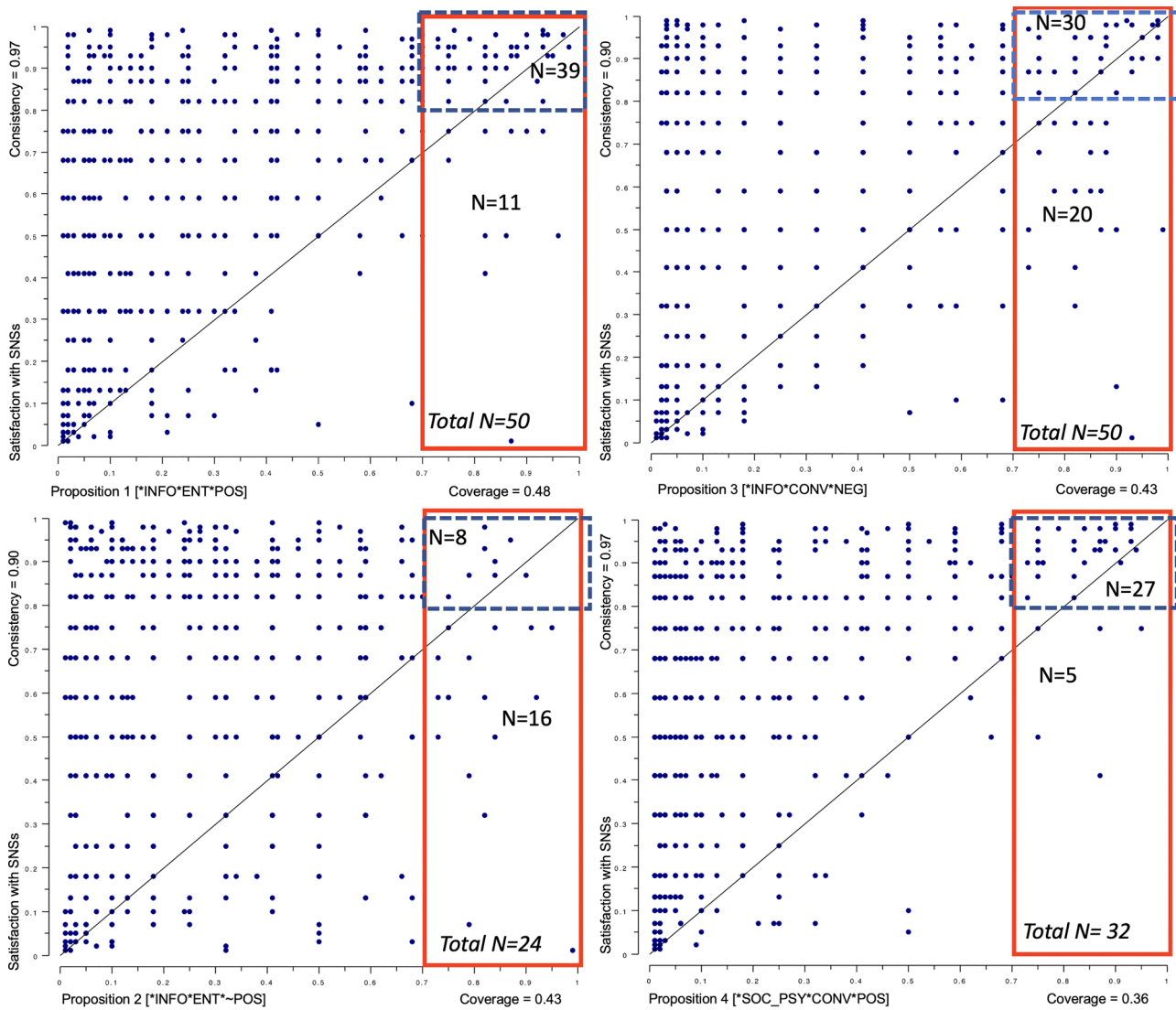
Fig. 2. *"Fuzzy XY plots for testing propositions 1-4. Rectangles highlight cases for which the propositions have values over 0.7 but satisfaction with SNSs can be either high (over 0.8) or low, describing different persons in the sample.* Note: ENT; Entertainment, INFO; Information seeking, SOC_PSY; Social Psychological, ENTER; Entertainment, POS; Positive Emotions, NEG; Negative Emotions.

users' emotions, and second the ability of emotions to increase users' satisfaction when their motivations remain at low levels, by either being less important for them or by not being adequately covered.

In detail, the findings show that convenience is present (i.e., high) in 6 out of 8 solutions and always as a core factor, suggesting that it has a critical role in driving user satisfaction (Kim et al., 2011). In general, it is expected that users will prefer to use services or tools that are easy to use, can be accessed at all times, and do not require increased effort. The technological advancement of smartphones allows the users to get such services, thus increasing their satisfaction. Nonetheless, too much use and steep evolution of ICT may generate stress to the users (Lee, Son, & Kim, 2016), thus beyond convenience users' motivations and emotions are examined. Our findings show that entertainment and information are present (i.e., high) in 5 out of 8 solutions, except for social-psychological motivations which are mainly absent (i.e., low). Although the latter may be explained by the relatively low values in users' responses (see Appendix A), it is interesting to note that one may not actively use SNSs to fulfil such needs, suggesting that over time people change the way they use SNSs. Indeed, previous findings show that convenience does not have an impact on satisfaction for high habitual users, but it is important for low habitual users (Bae, 2018). The existence of multiple combinations indicates that convenience when

using SNSs is related to users' other motivations, because if a service or tool is easy or simple to be used, then this is likely to improve access to information and entertainment and make communication with others more efficient.

SNSs are both utilitarian and high experiential systems, thus, to increase our understating of their use it is essential to investigate internal factors and how they may lead to more satisfied users. The findings provide combinations on which emotions are present less often than entertainment, information, and convenience motivations. Furthermore, the findings show how users may be satisfied with SNSs even when positive emotions are low or negative emotions are high. As with most online services (Oliver, 2014; Pappas, 2018), the use of SNSs can generate different emotions, and since people have different motivations when using SNSs (Kim et al., 2010, 2011), our findings provide different solutions that explain people with different motivations and emotions. We identify specific patterns of users for whom these factors are important and influence greatly their satisfaction. This confirms that satisfaction can be achieved also with the absence or negation of factors that are, in general, considered as essential in user behavior (e.g., positive emotions), thus, verifying the need to examine combinations of these factors to better explain user satisfaction and experience.

Table 5
Combinations that lead to low/medium satisfaction when using SNSs.

Condition	Solutions for the negation of Satisfaction			
	1	2	3	4
Motivation				
Entertainment		⊗		⊗
Information seeking	⊗			⊗
Social Psychological	⊗	⊗	⊗	⊗
Convenience	⊗	⊗	⊗	⊗
Emotions				
Positive	⊗	⊗	⊗	
Negative			●	•
Consistency	.91	.89	.90	.92
Raw Coverage	.45	.55	.41	.30
Unique Coverage	.02	.05	.02	.01
Overall Solution Consistency		0.84		
Overall Solution Coverage		0.65		
Note: Black circles (●) indicate the presence of a condition, and circles with "x" (⊗) indicate its negation. Large circles indicate core conditions, and small ones represent peripheral conditions. Blank spaces indicate that a condition may be either present or absent.				

5.1. Theoretical implications

The theoretical implications of the present study stem from the novel approach and methodology that is employed. We differentiate from the majority of the studies that are based on variance-based methods to investigate users' motivations and needs from SNSs [e.g., (Bae, 2018; Islam et al., 2019; Kim et al., 2011)]. These methods are based on the assumption that the relation among variables is symmetric, which may not be a realistic representation of real-life phenomena because relations among variables can be asymmetric (Fiss, 2011; Woodside, 2017). Building on complexity and configuration theories, fsQCA can capture this asymmetry between users' motivations, emotions and increased satisfaction, leading to the creation of new hypotheses and theories. Furthermore, we contribute and extend other studies that employ fsQCA (Capatina, Micu, Micu, Bouzaabia, & Bouzaabia, 2018; Kourouthanassis et al., 2017; Krishen et al., 2016;

Mikalef, Pappas, & Giannakos, 2016) by formulating specific propositions that are able to identify the specific types of users within our sample, thus contributing to theory development (de Guinea & Raymond, 2020; Pappas, 2018; Woodside, 2017). In detail, the propositions show how many users with similar motivations and emotions have different levels of satisfaction. The findings present complex patterns among the antecedents of satisfaction and showcase the asymmetric relations that lead to the same outcome. We empirically demonstrate that people with the same levels on motivation and emotion will not be equally satisfied, suggesting that other models of user behavior need to be identified to explain such cases. In addition, we test for predictive validity of our model by using subsamples, which is not as common as testing for model fit in empirical studies (Woodside, 2016). Testing for model fit is not enough as a well fitted model may not predict well the outcome.

The study also contributes to U&G research on content and process

Table 6
Complex configurations indicating high satisfaction for the subsample.

Models from Subsample for High Satisfaction	Raw Coverage	Unique Coverage	Consistency
1. POS*CONV*INFO*ENT	0.42	0.08	0.97
2. ~POS*CONV*~SOC_PSY*~ENT	0.40	0.04	0.88
3. ~NEG*~POS*CONV*~SOC_PSY	0.43	0.02	0.90
4. NEG*CONV*~SOC_PSY*INFO	0.31	0.01	0.89
5. ~NEG*~POS*~SOC_PSY*~INFO*ENT	0.21	0.01	0.87
6. NEG*~POS*~CONV*~SOC_PSY*ENT	0.16	0.01	0.84
7. ~NEG*POS*CONV*SOC_PSY*INFO	0.20	0.02	0.98
8. NEG*~POS*CONV*SOC_PSY*ENT	0.20	0.02	0.98
Overall Solution Consistency	*0.85*		
Overall Solution Coverage	*0.77*		

Note: CONV; Convenience, INFO; Information seeking, SOC_PSY; Social Psychological, ENTE; Entertainment, POS; Positive Emotions, NEG; Negative Emotions.
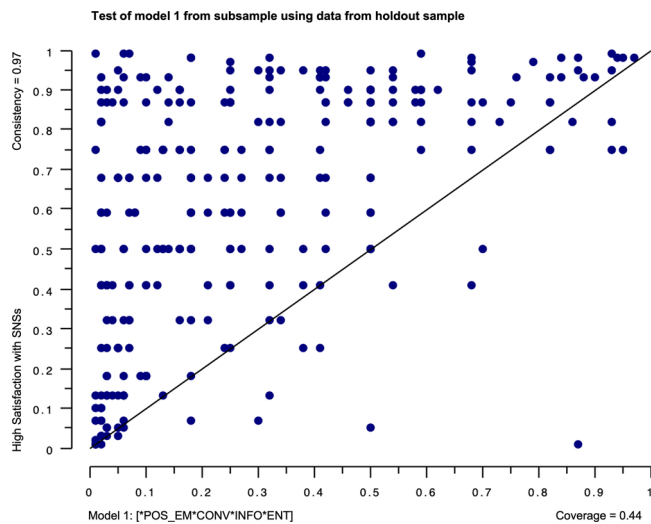
Fig. 3. Testing for predictive validity.

gratifications from SNS use offering a deeper understanding (Islam et al., 2019; Li et al., 2017; Mäntymäki & Islam, 2016) as we examine the interrelation among users' motivations and emotions from previous experiences in an ongoing activity such as the one of using SNSs. In detail, our study is among the few [e.g., (Krishen et al., 2019)] that combine UGT with complexity and configuration theories through fsQCA to identify necessary and sufficient conditions that explain users' satisfaction with SNSs. Prior research has identified factors such as interpersonal communication, social support, entertainment, informational value, cognitive and affective perceptions as predictors of users' satisfaction or behavior with SNSs (Ha et al., 2015; Hsu et al., 2015; Islam et al., 2019). However, our findings show how such factors may explain high or low/medium satisfaction depending on how they combine with each other and that there is not one solutions that fits all. Thus, we go beyond the common discussion on the most important factor and the single best solution of symmetric tests.

This study extends previous research in the area of SNSs (Bae, 2018; Islam et al., 2019; Kim et al., 2010, 2011) by providing an alternative view on how motivations and emotions combine with each other to explain high satisfaction from SNSs use. Previous studies have found that socializing, entertainment, seeking information, psychological, and hedonic motivations (Shareef et al., 2018; Chung & Buhalis, 2008; Kim et al., 2011; Krishen et al., 2016) have a direct influence on users' intention to participate in SNS interactions or their overall satisfaction from these interactions. The multiple combinations identified in this study, suggest that we should seek for multiple solutions when examining user experience and satisfaction in SNSs, as they are likely to explain the behavior of different people in the sample, and by extension in our society. Also, we are consistent with previous findings that highlight the importance of convenience, information seeking motivation and entertainment in SNSs use (Chung & Buhalis, 2008; Kim et al., 2011), but without examining how different combinations and interrelations of them can better explain user satisfaction. Thus, we offer empirical support on how different levels of motivations and emotions explain user satisfaction, a relation that has not been examined deeply in the past.

We contribute to the literature on SNSs by including multiple dimensions of emotions and studying in the same model positive and negative emotions together, since they may overlap or one may diminish the other (Pappas et al., 2016). Previous findings show that SNSs use may lead to the creation of both positive (e.g., enjoyment, fun) (Sullivan & Koh, 2019) and negative emotions (e.g., anxiety, depression, regret) (Dhir et al., 2018; Islam et al., 2019). Such emotions are expected to influence user satisfaction and behavioral intentions at

different stages of users' interaction with online services (Bagozzi et al., 2016; Pappas et al., 2017). The findings show that positive emotions, a typically main antecedent of satisfaction (Oliver, 2014), is present as a core factor in one solution together with negative emotions as a peripheral factor. This verifies that positive and negative emotions can co-exist. Also, it suggests that users' motivations, and the need to fulfil them, can overcome how they feel when using SNSs. The findings offer three solutions on which negative emotions are on high levels, but users were still satisfied from SNSs. This may be due to convenience or positive emotions being present in the solutions, but being able to identify what happens when negative emotions exist allows us to better understand the users and by extension better predict their behavior (Pappas et al., 2017; Penz & Hogg, 2011). We contribute to the literature by offering deeper insight on how motivations and emotions can combine to predict user satisfaction, thus, aiding researchers to revisit models and theories on user satisfaction and behavior to better capture the complexity of using SNS.

5.2. Practical implications

The findings of this study provide useful implications for managers and practitioners of SNSs. In detail, they can gain insight on what motivates their satisfied users, or how they feel when they use SNSs to fulfil their needs. It is important for practitioners to interact frequently with their users to better understand what influences their behavior. SNSs strategists should consciously generate relevant content that will not only be appealing and interesting to the target audience, but will also be appreciable and precise, in order to maintain a healthy and loyal relationship with their audiences (Dwivedi, Kapoor, & Chen, 2015). Companies need to effectively utilize social networks to increase their performance and to obtain knowledge on how to select and build relationships with their customers within social networks (Shiau, Dwivedi, & Yang, 2017; Shiau, Dwivedi, & Lai, 2018), thus knowing what motivates satisfied users can lead to improved persuasion strategies. Such strategies may include the implementation of enjoyment-reinforcing experiences in fostering user engagement in digital platforms in general (Pacauskas, Rajala, Westerlund, & Mäntymäki, 2018) as well as in SNSs in particular (Mäntymäki & Riemer, 2016). Due to the constant interaction of users with SNSs, designers, managers, and practitioners in general need to develop practices of engagement that will outline how brands and businesses frame their understanding of what means to create and manage user experiences with SNSs.

The identified solutions provide support to managers and practitioners on how to improve their online strategies and business models, since for the optimization of the available services or the development of new ones, they can choose the optimal mix of motivations and emotions to target their users accordingly. Although new SNSs appear frequently and the number of SNSs users increases regularly (eMarketer, 2017), not all platforms show the same growth. The intense competition among SNSs, along with users' always developing new needs and requirements (Chung & Buhalis, 2008; Krishen et al., 2016), suggests that further research is needed in the area. Although such SNSs may seek to keep their users' motivated, engaged, and focused on their own networks, at the same time, they need to be flexible and agile to collaborate with other SNSs to find their niche that will make them stand out. Indeed, practitioners can build upon the identified paths in this study to better explain the rationale of users' decisions, and by extension focus on specific functionality or create more effective communication strategies. For example, a new SNS that only offers services through a mobile application may focus on increasing convenience and entertainment or information for its users, depending on the services and functionality it supports. Such a mobile application could be a health and activity tracking app that allows users to share details and progress with their friends. Adding an Augmented Reality function that shows how users will look like if they meet their goal can be a highly motivating factor to be satisfied and use the application.

6. Conclusions

The present study verifies that in SNSs users' motivations and emotions have a key role in forming their satisfaction and it shows that multiple different combinations of motivation emotions exist explaining equally user satisfaction. Motivations seem to have a more important role than emotions as in some cases they are able to explain users' satisfaction with SNSs regardless if the users feel positive or negative emotions. Also, even with the absence of high positive emotions (i.e., existence of low/medium emotions) users may be satisfied depending on what motivates them to use SNSs. Nonetheless, both positive and negative emotions are parts of solutions that lead to high satisfaction, indicating their importance in understanding user experience and behavior. Notably, even with the presence of high negative emotions or mixed emotions (i.e., both positive and negative emotions) some users can still be satisfied highlighting the need for more advanced and individualistic profiling. The main objective of this study is to identify how motivations and emotions combine with each other to predict users' satisfaction in SNSs. To identify such complexities and detect causal recipes of factors, we perform configurational analysis and employ fsQCA, differentiating from traditional studies in the area that focus on variance-based methods, and we identify multiple solutions explaining the same outcome. The different solutions show that none of the dimensions of motivations and emotions can predict satisfaction on their own, but a combination of these factors is needed.

SNSs, as all companies, constantly seek to increase their number of users in order to increase performance and generate more value. To this end, they offer new services or products to address users' needs, find new and better ways to cover these needs, and more importantly to create new needs that will increase user participation, engagement, and overall satisfaction. In addition, as SNSs are used as a medium by other companies to contact and attract consumers, this adds to the need for more empirical studies to improve our understanding of the complexities within users' needs, motivations, and emotions in online environments. Keeping the user in the centre, this work serves as a stepping stone for future research in the area of SNS and provides insights for the companies that seek to increase their customers engagement in order to create value.

6.1. Limitations and suggestions for future work

As all empirical studies, this study suffers from some limitations. First, the sampling method may limit the generalization of the findings because snowball sampling was used to recruit respondents. Further, the findings are based on self-reported data. Future studies may combine self-reported data with real data from using SNSs, and extend them with semi-structured interviews, observations, which may provide deeper insight on user satisfaction. In addition insight from social media analytics, which is very important for both research and practice (Aswani, Kar, Ilavarasan, & Dwivedi, 2018) contributing also in the advancements of business intelligence for digital transformation (Mikalef, Pappas, Krogstie, & Pavlou, 2020; Pappas, Mikalef, Giannakos, Krogstie, & Lekakos, 2018), can be transformed accordingly to be analyzed using asymmetric methods and fsQCA, following similar approaches in other fields (Papamitsiou, Economides, Pappas, & Giannakos, 2018; Pappas et al., 2019).

FsQCA does not capture the unique contribution of every variable for every solution, instead it identifies complex combinations of variables and the amount of the outcome that is explained by these combinations. Also, here we only examine users' motivations and emotions as antecedents of satisfaction. Researchers may include more variables

that have been found to influence users' satisfaction as well as examine their effect on behavior (Alalwan et al., 2017). Specifically, considering the multidimensional nature of emotions, future studies may also group emotions based on their intensity, thus, differing between strong and weak positive/negative emotions (Pappas et al., 2016; Scherer et al., 2013), which can offer useful information on the interrelations among emotions' dimensions and their role in formulating motivations, satisfaction and behavior. This study measures emotions via self-reports based on users' previous experiences for an activity that is ongoing (use of SNSs); future observational studies and experiments of various sorts may offer increased insight on users' overall behavior (De Guinea & Markus, 2009). For example, users' emotions may be captured through their mobile phone's camera when using SNSs (Niforatos & Karapanos, 2015), leading to more accurate results regarding users' affective states while using SNSs.

Moreover, since the way people use SNSs differs significantly and depends both on the type of SNS and the context (Kapoor et al., 2018), future studies may employ fsQCA to examine how companies use social networks to better contact their customers for marketing purposes (Shareef, Mukerji, Dwivedi, Rana, & Islam, 2019) or how governments interact with their citizens (Aladwani & Dwivedi, 2018). The different types of SNSs existing today (e.g., content and update sharing sites, professional networks, education, dating sites, etc), combined with the fact that most people use one or more of them for different reasons, raises the need to conduct studies that focus on specific types of SNSs, similar to the numerous studies on Facebook or WeChat among the most popular SNSs in the world [e.g., (Krause et al., 2014; Mäntymäki & Islam, 2016; Shareef et al., 2018)]. Furthermore, since the way SNSs are used is rather mixed (e.g., LinkedIn is also used for photo sharing, and Facebook is also used for professional purposes), a comparison among motivations and emotions for isolated categories of SNSs would offer important insight on how people choose to use an SNS, continue using it, as well as the time they spend on it. In addition, items measuring satisfaction may be updated to consider aspects of actual use of the system rather than examining the decision to use it in the first place since most people use some type of SNS today. FsQCA can help identify how well-known factors can be combined to form sufficient and necessary conditions for explaining user experience, attitude and behavior. Finally, future studies, can employ multi methods or mixed methods (French, Luo, & Bose, 2016; Mäntymäki & Riemer, 2014) and can examine direct and indirect effects of motivations and emotions on users' satisfaction, and complement or extend our findings by comparing findings from both fsQCA and regression-based analyses.

CRediT authorship contribution statement

Ilias O. Pappas: Conceptualization, Methodology, Formal analysis, Investigation, Writing - original draft. **Sofia Papavlasopoulou:** Conceptualization, Investigation, Writing - original draft. **Patrick Mikalef:** Writing - review & editing. **Michail N. Giannakos:** Writing - review & editing.

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Appendix A

Scale items with mean, standard deviation and standardized loading

Construct and scale items	Mean	S.D.	Loading
Entertainment Motivations			
I use SNSs to forget about work or other things	3.01	1.77	0.61
I use SNSs to relax	4.82	1.64	0.83
I use SNSs to feel excited.	3.37	1.56	0.75
I use SNSs to pass the time	5.18	1.62	0.70
Information Seeking Motivations			
I use SNSs to learn about unknown things	4.94	1.57	0.88
I use SNSs to do research	4.00	1.92	0.78
I use SNSs to learn about useful things	4.69	1.68	0.92
I use SNSs to get new ideas	4.93	1.57	0.86
Social Psychological Motivations			
I use SNSs to seek identity	2.39	1.47	0.74
I use SNSs to keep relationship with members	4.26	1.84	0.82
I use SNSs to seek a sense of belonging	2.36	1.52	0.78
I use SNSs to get involved with members	3.40	1.75	0.86
Convenience Motivations			
I use SNSs anytime, anywhere	4.01	1.97	0.80
I use SNSs conveniently	5.01	1.58	0.90
I use SNSs easily	5.41	1.51	0.87
I use SNSs and get what I want for less effort	4.57	1.74	0.79
Satisfaction when using SNSs			
I am satisfied with the experience of using SNSs	4.66	1.38	0.90
I am pleased with the experience of using SNSs	4.54	1.35	0.91
My decision to use SNSs was a wise one	4.05	1.50	0.83
My feeling with using SNSs was good	4.50	1.39	0.90

Emotions							
	Mean	SD	Loading		Mean	SD	Loading
Positive							
Pleasure	4.13	1.64	0.88	Contentment	3.69	1.70	0.87
Joy	3.90	1.61	0.86	Admiration	2.99	1.66	0.79
Pride	2.49	1.57	0.73	Love	2.69	1.64	0.75
Amusement	4.63	1.55	0.77	Relief	2.59	1.58	0.71
Interest	4.44	1.46	0.66				
Negative							
Anger	2.42	1.58	0.78	Disappointment	2.87	1.89	0.81
Hate	1.80	1.32	0.77	Shame	2.08	1.56	0.80
Contempt	2.31	1.63	0.76	Regret	1.87	1.35	0.68
Disgust	2.27	1.65	0.86	Guilt	1.71	1.27	0.62
Fear	1.95	1.44	0.67	Sadness	2.30	1.63	0.80
				Compassion	2.71	1.67	0.69

Appendix B. Supplementary data

Supplementary material related to this article can be found, in the online version, at doi:https://doi.org/10.1016/j.ijinfomgt.2020.102128.

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