



Exploring loneliness and social networking: Recipes for hedonic well-being on Facebook

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ABSTRACT

Every day, billions of people participate on social networking sites such as Facebook. We are now more virtually “connected” than ever before, yet for many individuals, the world is a very lonely place, both physically and virtually. This study takes a self-determination theory (SDT) perspective to explore the recipes for hedonic well-being derived from Facebook, the world’s most popular social media network, for users with high versus low levels of perceived loneliness. A random sample from a panel of participants throughout the US of $n = 323$ analyzes active members of Facebook with fuzzy-set qualitative comparative analysis (fsQCA). Our findings suggest that, in the context of social exclusion, interactivity and belonging may be the psychological needs that *drive* Facebook usage for high loneliness individuals and simultaneously the *reward* for low loneliness ones.

1. Introduction

Social support and connectedness are vital to achieving a sense of well-being, and individuals can spend an entire lifetime on the quest for a sense of well-being (Stillman et al., 2009). However, with loneliness and its potentially devastating impact on individuals and society as a whole at epidemic levels (Cigna, 2018; Waldinger, 2015), this challenge is even more difficult. In recent years, participation in social media networks has been a pervasive and significant part of the daily routine of a large part of society, no matter the demographics or psychographics. Often, individuals feel alone even though they appear to be more connected than ever before as billions participate on social networking sites such as Facebook on a regular basis (Statista, 2019). In fact, social media offers both problems and solutions when it comes to its impact on the well-being of its users (Sheldon, Abad, & Hinsch, 2011). Research shows that social networking platforms such as Facebook can be a double-edged sword that can lead to both positive and negative experiences and outcomes for users. Thus, the ingredients for a sense of well-being may differ according to both individual and situational characteristics. In terms of how individuals use social media, it has benefits but also costs; its use affects physical social space by compensating, augmenting, invading, or disconnecting individuals with high versus low levels of perceived loneliness (Berezan, Krishen, &

Jenjeja, 2019). An individual’s perceived level of loneliness at any point in time and their psychological needs may determine whether their time spent on social media positively affects hedonic well-being.

This study uses the self-determination theory (SDT; Ryan & Deci, 2000) to identify the recipes for hedonic well-being that are derived from Facebook, the world’s most popular social networking site (Statista, 2019). We examine these recipes with users with high versus low levels of perceived loneliness. Furthermore, this study focuses on the SDT needs of relatedness (belonging, emotional connection) and competency (interactivity), along with the fear of missing out (FoMO) as potential ingredients for recipes of hedonic well-being when using Facebook. Rather than focusing on causation, this study uses fuzzy-set qualitative comparative analysis (fsQCA) and approaches the data with a qualitative lens to view the recipes for hedonic well-being. Overall, this study contributes to the marketing literature by taking a uniquely qualitative approach to explore loneliness as it relates to social networking, specifically through the lens of SDT. Additionally, the results will enable practitioners to better understand implications for perceived well-being of consumers when using social media platforms. Next, a review of the relevant literature builds the foundation for the study’s propositions. This is followed by a discussion of the methodology and analysis. Finally, a section on conclusions, future research and study limitations is presented.

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Table 1
Construct items.

Construct and Reference	Items
BELONGING ($\alpha = 0.88$) (Lin, 2008)	1. I am proud to be a member. 2. I enjoy being a member. 3. I feel a strong sense of belonging.
INTERACTIVITY ($\alpha = 0.881$) (McMillan & Chavis, 1986)	1. Members influence my thoughts and activities. 2. I am able to influence the actions and feelings of other members. 3. My opinions matter to other members. 4. I care about what other members think of my actions.
EMOTIONAL CONNECTION ($\alpha = 0.866$) (McMillan & Chavis, 1986)	1. I feel I am well understood by other members on Facebook 2. I have the feeling of closeness with other members. 3. I get along well with other members. 4. I feel other members are friendly to me.
HEDONIC WELL BEING ($\alpha = 0.94$) (Guevarra & Howell, 2015)	1. How much does Facebook contribute to your happiness today? 2. How much has Facebook contributed to your overall life's happiness? 3. How much do you think Facebook increased your overall life satisfaction?
FEAR OF MISSING OUT (FoMO) ($\alpha = 0.899$) (Przybylski et al., 2013)	1. I fear that others have more rewarding experiences than me on Facebook. 2. I fear that my friends have more rewarding experiences than me on Facebook. 3. I get worried when I find out my friends have friends without me on Facebook. 4. I get anxious when I don't know what my friends are up to on Facebook. 5. It is important that I understand my friends' inside jokes on Facebook. 6. Sometimes I wonder if I spend too much time keeping up with what is happening on Facebook. 7. It bothers me when I miss an opportunity to connect with friends on Facebook. 8. When I have a good time, it is important for me to share the details on Facebook (e.g., status updates). 9. When I miss out on an event posted on Facebook, it bothers me. 10. When I go on vacation, I continue to keep tabs on what my friends are doing on Facebook.
LONELINESS (SELSA-S) ($\alpha = 0.87$) (DiTommaso et al., 2004)	1. I feel part of a group of friends. ^R 2. My friends understand my motives and reasoning. ^R 3. I don't have any friends who share my views, but I wish I did. 4. I am able to depend on my friends for help. ^R 5. I do not have any friends who understand me, but I wish I did. 6. I feel alone when I am with family. 7. There is no one in my family I can depend on for support and encouragement, but I wish there was. 8. I feel close to my family. ^R 9. I feel part of my family. ^R 10. My family really cares about me. ^R 11. I have a romantic partner with whom I share my most intimate thoughts and feelings. ^R 12. I have a romantic or marital partner who gives me the support and encouragement I need. ^R 13. I wish I had a more satisfying romantic relationship. 14. I have a romantic partner to whose happiness I contribute. ^R 15. I have an unmet need for a close romantic relationship.

R = reverse scaled items

Italics = chronic version of the SELSA-S

Table 2
Sample demographics.

		High Loneliness Cohort		Low Loneliness Cohort	
		Frequency N	Percentage %	Frequency N	Percentage %
Gender	Male	111	67.7	123	77.4
	Female	53	32.3	34	21.4
	Other	–	–	2	1.3
	TOTAL	164	100	159	100
Age	Baby Boomers (1946–64)	55	33.5	68	42.7
	GenX (1965–1983)	70	42.7	54	34.0
	GenY (1984–2002)	39	23.8	37	23.3
	TOTAL	164	100	159	100

2. Literature review & theoretical framework

2.1. Hedonic well-being

Hedonic well-being results from the pleasure one experiences when they are able to increase positive affect and decrease negative affect (Ryan & Deci, 2001). Hedonic well-being can positively influence life satisfaction (Disabato, Goodman, Kashdan, Short, & Jarden, 2016; Kim-

Prieto, Diener, Tamir, Scollon, & Diener, 2005) and is related to one's ability to satisfy the fundamental psychological needs of relatedness, competency, and autonomy. According to self-determination theory (SDT), only by satisfying these needs can an individual achieve a sense of well-being (Ryan & Deci, 2000), whether in physical or virtual space (Berezan et al., 2019).

Numerous studies conclude that limiting time spent on social media is vital to one's well-being. For example, engagement in the social comparison that social media incites is often cited as having a negative impact on psychological well-being (Tandoc, Ferrucci, & Duffy, 2015; Verduyn et al., 2015; Wang, Jackson, Gaskin, & Wang, 2014). However, for nearly every individual, perceived well-being has a slightly different meaning and the quest for a sense of well-being involves a different recipe. Social media networking can influence the satisfaction of SDT's psychological needs in different ways according to individual characteristics of users, including levels of loneliness; some benefit while others have negative outcomes (Berezan et al., 2019).

2.2. Self-determination theory and social media

SDT argues that satisfying the basic needs of relatedness, autonomy, and competence are vital to what we all want – a sense of well-being (Ryan & Deci, 2000). A multitude of studies on social networking sites and well-being have applied this theory (Jang, Bucy, & Cho, 2018; Lee, 2018). Social networking sites have the ability to provide these needs,

Table 3
Construct descriptions: high vs low loneliness cohorts.

Construct	Range of Multiplicative Construct Score	Low Loneliness Cohort (n = 159)			High Loneliness Cohort (n = 164)		
		Threshold for Full Membership (0.05)	Maximum Point of Ambiguity (0.5)	Threshold for Full Membership (0.95)	Threshold for Full Membership (0.05)	Maximum Point of Ambiguity (0.5)	Threshold for Full Membership (0.95)
FEAR OF MISSING OUT (F)	1-282475249	2	1792	7,563,150	2	11,520	22,680,000
INTERACTIVITY (I)	1-2401	5	256	2058	2	256	1260
BELONGING (B)	1-343	24	144	294	6	100	294
EMOTIONAL CONNECTION (E)	1-2401	81	784	2058	32	480	1715
HEDONIC WELL-BEING (H)	1-2401	2	64	252	2	64	168

and as such many of us are motivated to pursue a sense of well-being through our activity on them (Berezan et al., 2019; Sheldon & Gunz, 2009; Sheldon et al., 2011). The definition of a social networking site (SNS) itself requires social connectedness (i.e., relatedness) among users (Hoffman & Novak, 2012). Thus, this study proposes that satisfying the need for relatedness may be essential to the perceived well-being of many SNS users. Relatedness is the human need to connect emotionally and to develop relationships that result in a sense of belonging (Baumeister & Leary, 1995). Thus, the underlying indicators of relatedness used in this study are from the constructs of emotional connection (E; McMillan & Chavis, 1986) and belonging (B; Lin, 2008). The need for competency is about the ability to influence others (Ryan & Deci, 2000) and can be measured by the interactivity construct (I; McMillan & Chavis, 1986). SDT's needs motivate human behavior such as one's pursuit of well-being through the use of SNSs.

2.3. Fear of missing out (FoMO) and social media

Marketers have long capitalized on the psychological phenomenon of FoMO that Przybylski, Murayama, DeHaan, and Gladwell (2013) define as an uncomfortable feeling generated within an individual when he or she thinks that others may be having enjoyable or rewarding experiences in his or her absence. Friends and family often use FoMO to influence individuals in their lives, such as joining them on a “once in a lifetime” trip or going to a concert that “everyone is attending.” What is new is the manner and pace at which FoMO now spreads. SNSs help FoMO spiral into one of the most powerful drivers of consumer behaviors that range from seemingly meaningless use to making important life decisions. SNSs often exacerbate FoMO due to the ability of users to “manage” the way that others view them by presenting a perfect image of who they are, that is, self-presentation and impression management (Crabtree & Pillow, 2018). Activities such as censoring, exaggerating, and even lying about one's life when creating online content can achieve FoMO that results in others feeling envy, and overall less worthy, less happy, and even unsuccessful by comparison (Chou & Edge, 2012; Jordan et al., 2011).

The literature shows that FoMO arises from the desire to satisfy one's basic psychological needs that the SDT proposes, specifically the need for relatedness. FoMO therefore often acts as a mediator between the needs of SDT and social media behaviors that attempt to satisfy these needs, with high FoMO being related to social media engagement and frequency of use. Unmet SDT needs that result in FoMO (F) may motivate attempts to compensate by engaging in SNSs (Przybylski et al., 2013).

2.4. Antecedents to social media satisfaction

Based on the research literature, this study proposes four key antecedent variables to derive the recipes for hedonic well-being (H): belonging (B), fear of missing out (F), interactivity (I), and emotional connection (E).

Therefore, research proposition 1 is as follows:

Proposition 1. A recipe for hedonic well-being uses the full dataset

$$F \cdot I \cdot B \cdot E \leq H$$

F = Fear of missing out, I = Interactivity, B = Belongingness, E = Emotional connection.

2.5. Social media and loneliness

Everyone experiences some level of loneliness from time to time, but loneliness is now at an epidemic level (Cigna, 2018) that impacts individuals, families, organizations, and communities. Loneliness is a subjective state of being that results from perceived deficiencies in our personal relationships (Perlman & Peplau, 1981; Rippe, Smith, &

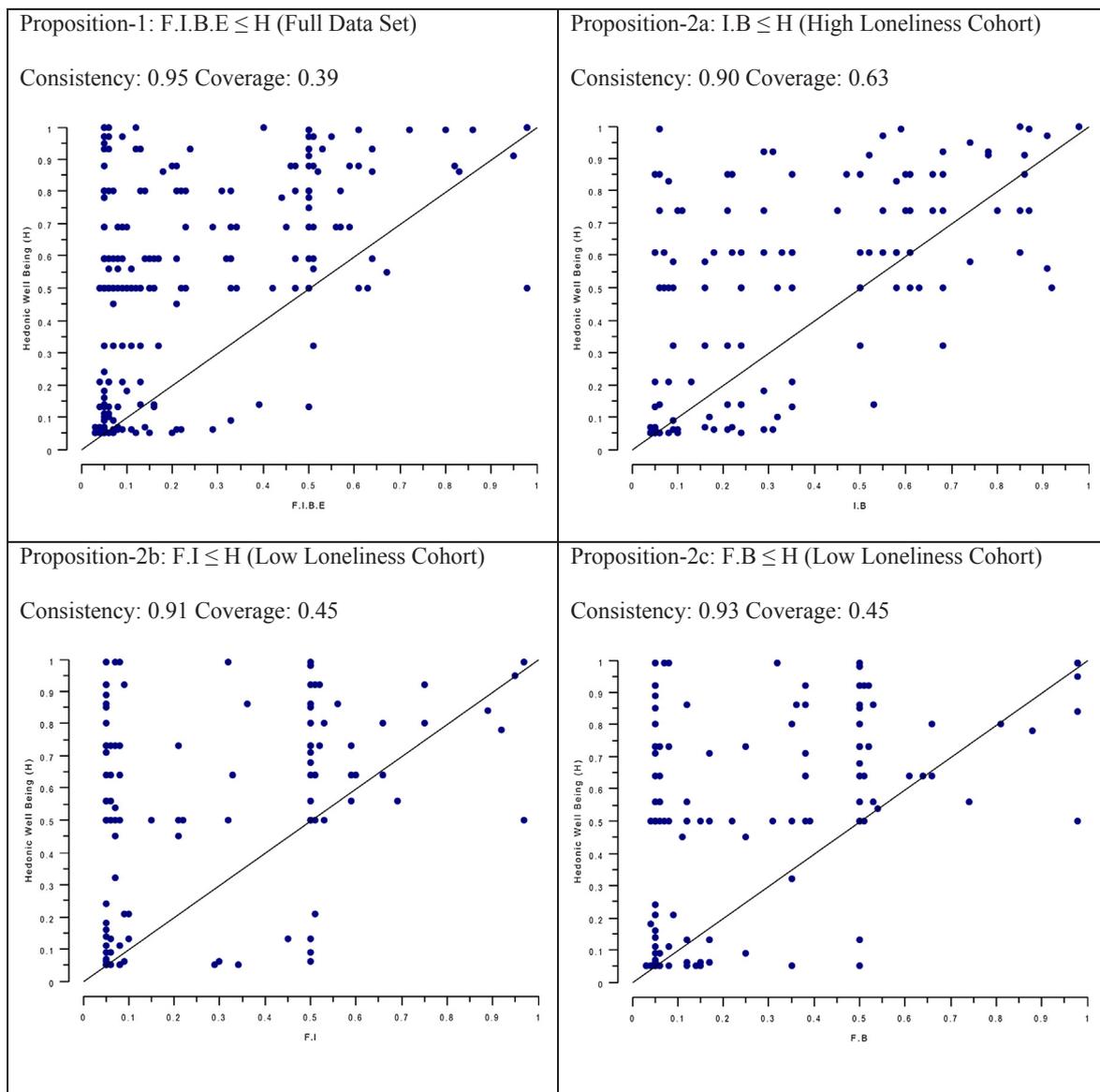


Fig. 1. X-Y plots for all propositions.

Dubinsky, 2018). While many studies show that social media may cause loneliness, other research shows just the opposite while still other research finds that the relation is bidirectional and fluid (Nowland, Necka, & Cacioppo, 2018). SNSs such as Facebook can be valuable tools to stay connected with people from the real world, thereby enhancing and augmenting one’s physical space (Berezan et al., 2019; Ellison, Steinfield, & Lampe, 2007) due to their ability to support and enhance users’ social capital (Steinfield, Ellison, Lampe, & Vitak, 2010). The research in fact has found that the use of Facebook reduces the perceived loneliness of its users through supporting and extending such social connections (Lou, Yan, Nickerson, & McMorris, 2012). On the other hand, studies have also suggested that the internet has a negative impact on the well-being of users because it isolates them from the real world that increases loneliness (Rippe et al., 2018).

Although studies have found that the use of Facebook increases one’s social capital, this increase may depend on the particular individual’s behavior while using the platform. For example, the use of Facebook basically consists of comparing oneself to others. But the literature shows that merely consuming the content of others increases the perceived loneliness while decreasing social capital (Burke, Marlow, & Lento, 2010). On the other hand, those who actively use the platform

as a way to communicate (in effect socialize) with others may experience a decrease in perceived loneliness (Detert & Mehl, 2012). This study argues that an individual’s perceived level of loneliness influences his or her recipe for a sense of well-being when using SNSs that accounts for FoMO and the SDT needs for relatedness (belonging, emotional connection) and competency (interactivity). Just as each individual is unique, so is their need for relatedness and competency. This study uses the Social and Emotional Loneliness Scale for Adults (SELSA-S; DiTommaso, Brannen, & Best, 2004) to measure the perceived loneliness of participants.

The literature has shown differing SDT needs and levels of perceived loneliness according to generational cohorts. For example, studies consider Gen Y as having higher levels of loneliness (Cigna, 2018) and a greater need for relatedness than older generations (Berezan, Krishen, Agarwal, & Kachroo, 2018). This need can influence FoMO and ultimately a sense of well-being. This study then proposes that an individual’s unique perceived level of loneliness can disclose the SDT needs. Thus, the causal recipes that lead to higher hedonic well-being from the use of Facebook differ between high and low loneliness levels. Therefore, research proposition 2 is as follows:

Proposition 2. Recipes for high versus low loneliness cohorts

Table 4
Solutions for both cohorts.

High loneliness solutions			
Complex Solution frequency cutoff: 3 consistency cutoff: 0.81			
I. ~ B	0.37	0.04	0.80
F.I	0.49	0.02	0.88
B.E	0.66	0.10	0.83
I.B	0.63	0.06	0.90
F.B	0.90	0.04	0.71
Solution coverage: 0.87 Solution consistency: 0.76			
Parsimonious Solution frequency cutoff: 3 consistency cutoff: 0.81			
F	0.56	0.05	0.82
I	0.72	0.08	0.81
B	0.77	0.1	0.79
Solution coverage: 0.91 Solution consistency: 0.73			
Intermediate Solution frequency cutoff: 3 consistency cutoff: 0.81			
I. ~ B	0.37	0.04	0.80
F.I	0.49	0.02	0.88
B.E	0.66	0.10	0.83
I.B	0.63	0.06	0.90
Solution coverage: 0.87 Solution consistency: 0.76			
Low loneliness solutions			
Complex Solution frequency cutoff: 2 consistency cutoff: 0.81			
I. ~ B	0.35	0.05	0.81
F.I	0.45	0.01	0.91
B.E	0.66	0.13	0.80
F.B	0.45	0.08	0.93
F.E	0.43	0.06	0.91
Solution coverage: 0.89 Solution consistency: 0.77			
Parsimonious Solution frequency cutoff: 2 consistency cutoff: 0.81			
F	0.54	0.04	0.85
I	0.69	0.03	0.83
B	0.77	0.13	0.77
Solution coverage: 0.92 Solution consistency: 0.73			
Intermediate Solution frequency cutoff: 2 consistency cutoff: 0.81			
I. ~ B	0.35	0.05	0.81
F.I	0.45	0.01	0.91
B.E	0.66	0.13	0.80
Solution coverage: 0.89 Solution consistency: 0.77			

Table 5
Cross validation of models.

Models	High Loneliness Cohort		Low Loneliness Cohort	
	Consistency	Coverage	Consistency	Coverage
F.I.B.E	0.95	0.44	0.95	0.37
I.B	0.90	0.64	0.87	0.58
F.I	0.85	0.53	0.91	0.45
F.B	0.89	0.52	0.93	0.45
F.E	0.89	0.48	0.91	0.43

2.a For High loneliness Cohort – $I. B \leq H$

2.b For Low loneliness Cohort – $F. I \leq H$

2.c For Low loneliness Cohort – $F. B \leq H$

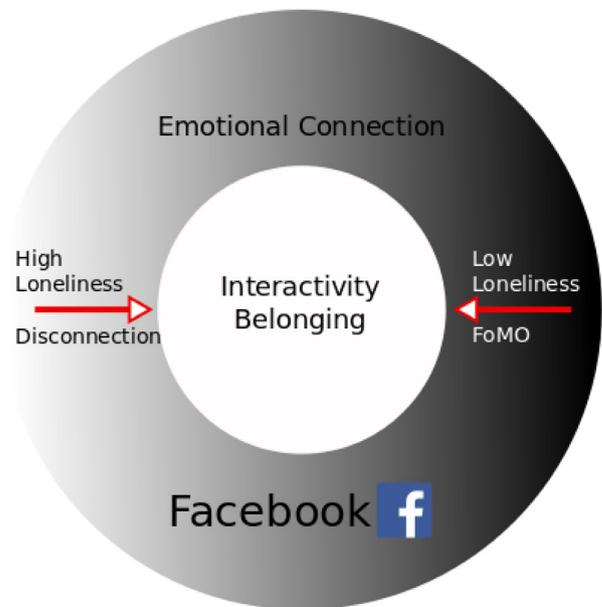


Fig. 2. Hedonic well-being interplay for low versus high loneliness individuals.

3. Method and analysis

Fuzzy-set qualitative comparative analysis (fsQCA) highlights the nonlinear relationships and complexity amongst configurations (made of independent variables) and outcome (dependent) variables that exist in reality, and is particularly applicable when dealing with high multicollinearity amongst the constructs of interest (Woodside, 2013, 2017). Multiple research disciplines utilize fsQCA to explore relationships between variables, resulting in recipes. For example, fsQCA is applied as a methodology in tourism research (e.g. Ferguson, Megehee, & Woodside, 2017; Papatheodorou & Pappas, 2017), and marketing and social networking studies (e.g., Berezan et al., 2018; Krishen et al., 2016a, 2016b; Krishen, Berezan, Agarwal, & Kachroo, 2019). The method is explained in the following subsections for the sampling and measures, data calibration, and results interpretation.

3.1. Sampling and measures

A professional marketing research agency drew a random sample from a panel of participants throughout the US. This sample improved its ecological validity by providing appropriate heterogeneity in the demographic profile of the respondents. The participants were eligible to participate if they met the following two criteria: (1) active member on Facebook, and (2) 18 years or older. The survey recorded a total of 400 responses. After removing incomplete responses there were 323 cases left. The cases were further split into two cohorts, high loneliness and low loneliness that had 164 and 159 cases respectively. The survey captured various demographic details (Table 2) along with subjective constructs such as interactivity, belonging, emotional connection, FoMo, and hedonic well-being. All items used Likert scales anchored by 1 = strongly disagree and 7 = strongly agree. All the constructs were created using established scales and had acceptable Cronbach alpha reliability scores of $\alpha = 0.7$ or higher. Table 1 provides details of these constructs and their items and Table 2 provides the reliability scores for all of them.

3.2. Data calibration

Fuzzy set scores for all antecedent, complex, and outcome conditions ranged from 0.00 to 1.00. According to fuzzy-set theory, these scores are indicative of a case's membership in a set. A score of 0.05 (or

less) indicates full non-membership, and a score of 0.95 (or higher) indicates full membership in the set. The fsQCA analysis requires transforming (calibrating) the multiplicative construct score from multiplying item scores for a construct into a fuzzy membership score. In this study, all the conditions, antecedent and outcome, were calibrated using records for the full set for each condition. The analysis uses the calibration procedure suggested by Box-Steffensmeier, Brady, Collier, and Ragin (2008) and Ragin (2009). The value immediately above 5 percent among all the cases is assigned the fuzzy membership score of 0.05 that signifies full non-membership. A fuzzy membership score of 0.5 is assigned to the median value, which signifies the maximum point of ambiguity. The value immediately below 95 percent among all the cases is assigned the fuzzy membership score of 0.95, which signifies full membership (Ragin, Drass, & Davey, 2006). The fsQCA software is used to perform the calibration subroutine of the analysis and to obtain the fuzzy scale membership scores between zero and one. The threshold values used in calibration are provided in Table 3.

3.3. Consistency and coverage

Consistency and coverage are the two most commonly used metrics for evaluating recipes from the fsQCA method. Consistency is a measure of the degree of overlap between a complex causal recipe and the outcome condition. In case of a high consistency score, the majority of the cases with high fuzzy membership scores will also have high membership scores for the outcome condition. Therefore, consistency is analogous to the correlation in traditional statistical theory (Woodside, 2013). Consistency of the subset relation $X_i \leq Y_i$ is computed as follows:

$$\text{consistency } (X_i \leq Y_i) = \sum \min[X_i, Y_i] / \sum X_i. \quad (1)$$

Here X_i represents case i 's membership score in the set X , and Y_i represents case i 's membership score in the outcome condition Y . The coverage score of any complex configuration is indicative of the percentage of the outcome that the complex solution explains. In other words, coverage is analogous to the R^2 measure in a regression analysis (Woodside, 2017). Coverage of the subset relation $X_i \leq Y_i$ is computed as follows:

$$\text{coverage } (X_i \leq Y_i) = \sum \min[X_i, Y_i] / \sum Y_i. \quad (2)$$

4. Results

The study adopts a two-pronged approach where it examines the solutions from the complex, parsimonious, and intermediate algorithms on the full dataset and the two split sets. The study also proposes and tests specific asymmetric configurational models based on the theories to eliminate possible problems caused by using asymmetric testing software (Ferguson et al., 2017). The consistency cutoff for acceptable complex statements is set to 0.9, which is a more stringent criterion than the recommended score of 0.8.

4.1. Estimating complex causal statements (recipes)

The fsQCA software uses the Quine-McCluskey algorithm to identify possible recipes for hedonic well-being. The model is as follows:

$$H = f(F, I, B, E) \quad (3)$$

Proposition 1 is valid with a high consistency score of 0.95 and an acceptable coverage score of 0.39. Proposition 2.a has a high consistency score of 0.90 and a coverage score of 0.64. Proposition 2.b has a high consistency score of 0.91 and a coverage score of 0.45. Lastly, Proposition 2.c is valid with a high consistency score of 0.93 and a coverage score of 0.45. Fig. 1 shows the x-y plots of all of the final solutions for the propositions, and Table 4 presents these results.

4.2. Testing for cross validation

The accepted models for a cohort are tested on the other cohort for cross validation. Table 5 provides details about the test. The consistency cutoff for accepting a complex statement is set to 0.90. The table shows that the models for one cohort are exclusive and are not acceptable for the other cohort.

5. Conclusions, future research, and limitations

This study examines the SDT needs of relatedness (belonging, emotional connection) and competency (interactivity) as well as FoMO and hedonic well-being that may arise from the use of social media networking for users with high versus low perceived levels of loneliness. Based on the literature, the study evaluates its propositions with fsQCA by identifying various recipes for a sense of well-being from social media networking. For the full data set (high and low loneliness participants) a combination of all tested antecedent variables (belonging, FoMO, interactivity, emotional connection) are ingredients for hedonic well-being. However, when the dataset is divided into high versus low loneliness cohorts, emotional connection no longer appears as part of the base recipes. For high loneliness participants, only interactivity and belonging are ingredients for well-being; furthermore, for this cohort, a high level of loneliness does not correlate positively with FoMO (see Berezan et al., 2019). On the other hand, as evident in the results for propositions 2.b. and 2.c. this study finds that individuals with low levels of perceived loneliness require FoMO as an ingredient in their recipes for well-being. The results for 2.b and 2.c show that for the low loneliness cohort, there are two recipes for well-being: one with FoMO and interactivity, and the other with FoMO and belonging.

Extant research argues that loneliness may be a chronic predisposition or a trait (Wang, Zhu, & Shiv, 2012) and finds that chronically lonely individuals may be more likely to participate in social interactions in ways that bolster rather than reduce their social exclusion (Vanhalst et al., 2015). Cacioppo, Fowler, and Christakis (2009) contend that loneliness is an individual characteristic that can also be measured through group dynamics. As such, the interaction of consumer loneliness and social networking behaviors is therefore both relevant and important. For consumers, social networks can potentially expand through the physical realm such as retail (e.g., Rippe et al., 2018) or through virtual contexts such as social networking tools (e.g., Berezan et al., 2019).

Our analysis identified belonging and interactivity as core recipes for subjective well-being on Facebook for both high loneliness and low loneliness individuals (i.e., propositions 2a, 2b, and 2c). These results fit with the two-process view of Facebook that states the self-determination theory needs can both motivate (reducing disconnection) and reward (gaining connection) connection-seeking behavior (Sheldon et al., 2011). Thus, in the context of social exclusion, interactivity and belonging may be the drivers of Facebook usage for high loneliness individuals and simultaneously the reward for low loneliness ones. Ample research supports the two-process view of Facebook usage, as studies indicate that loneliness in the physical world can be increased from overuse of virtual technology (Lee, Leung, Lo, Xiong, & Wu, 2011) or reduced from augmenting the physical world with virtual social networks (Berezan et al., 2019). Waytz and Gray (2018) provide a review of the research on the relationship between online technology and sociability that shows that the research is contradictory.

Neurobiological techniques demonstrate that FoMO is associated with a higher need for approval that can eventually lead to addictive behavior (Lai, Altavilla, Ronconi, & Aceto, 2016). Wegmann, Oberst, Stodt, and Brand (2017) also find links between FoMO and internet-use expectancies that can eventually lead to communication disorder. Our findings indicate that for low loneliness individuals, FoMO is part of both of the final recipes for hedonic well-being, but it is not part of the one for high loneliness individuals. As low loneliness individuals, they

have a higher level of social connection and more of a desire to form relational bonds; therefore, they are more likely to be fearful of missing out on social events or experiences. The research finds that FoMo is related to the need to belong and a constant state of desire for staying connected to and abreast of the significant experiences of an individual's social network (Seidman, 2013). Fig. 2 shows the interplay of ingredients for high versus low loneliness that is derived from our research. It shows that to achieve hedonic well-being through social media networking, chronically high loneliness individuals may be driven to disconnect from the “real world” because of their inability to meet their interactivity and belonging needs in their physical space; they may therefore seek to connect more in virtual space to satisfy these needs. On the other hand, chronically low loneliness individuals may utilize social networking to mitigate FoMo, as a positive reinforcement or reward. In our paradigm, we view loneliness as a fluid and dynamic state of being, and therefore, the gradient in the outer circle represents the flow of virtual and physical social connection, with a higher degree of social connection represented as a darker shade of gray.

Despite the insights provided by this study, a number of limitations exist. By using a mean split to divide participants into high versus low loneliness cohorts this study does not recognize the spectrum of perceived loneliness. By increasing the sample size, future research could evaluate recipes for hedonic well-being of SNS users for multiple levels of perceived loneliness to likely uncover additional findings. Further, future research could overlay generational differences in terms of perceived loneliness and hedonic well-being when using SNSs. Although Facebook is the most popular SNS worldwide, the research should examine the users of other social media networking platforms in other cultures.

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