

## Article

# A Study on the Millennials Usage Behavior of Social Network Services: Effects of Motivation, Density, and Centrality on Continuous Intention to Use

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**Abstract:** Whether in terms of social media platforms, mobile pay apps or an increasing acceptance of RFID chips in humans, technology has transformed everyday life for consumers. Social networks have experienced enormous growth as online personal networking media. Social exchange theory (for motivation and social reward) and theories of collective action can be applied in order to understand how an individual's behavior may exert effects on or receive influences from other users with regard to the continuance usage intention of social apps. First, this study aims to examine behavioral characteristics of the Millennials, and takes flow and social reward systematically so as to explore SNS users' continuance based on SNS characteristics. Targeting Millennials SNS users, this study empirically examines users' continuance intention at individual level and simulates users' continuance behavior at group level, which are expected to be influential as a next generation of purchasing group, focusing on social network services (SNS) usage. Second, this study tries to suggest strategic implications by identifying key factors that dominate SNS users' behavior in the process of experiencing SNS. For the empirical purpose, this study analyzes the relationship between SNS characteristics (motivation to use, density, and centrality) and usage behavior (flow, social reward, and continuous intention to use). As a result, each construct of motivation to use SNS, SNS density, and SNS centrality are positively linked with flow. Motivation to use SNS and SNS centrality are positively associated with social reward, however, SNS density does not have a significant effect on social reward. In addition, flow and social reward turn out to have positive linkage with continuous intention to use respectively. The findings of this study are expected to provide implications for researchers and operators in related fields to identify various factors that explain the SNS usages of the Millennials, especially the major factors that sustain SNS involvement and activities. This study can enrich both SNS continuance theory, and help SNS operators to manipulate resources effectively to attract and retain users.

**Keywords:** millennials; social network services; motivation; density; centrality; flow; social reward; continuous intention to use



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## 1. Introduction

Social influence as a change in an individual's thought, feeling, attitude, and behavior that results from interaction with another individual or a group. Influence is an invisible, complex, and subtle phenomenon that governs social dynamics and user's behavior [1]. A social network is a social structure made up of individuals or organizations, which are connected by one or more specific types of interdependency, such as friendship, kinship, common interest, likes/dislikes, or relationships of beliefs, knowledge, or prestige [2]. As the Internet evolved, online social networks emerged such as Twitter, LinkedIn, and Facebook [3]. Due to the particularity of service products and the complexity of service management and marketing, service-oriented enterprises have become more and more dependent, and instant messaging tools with rich distribution functions are widely used.

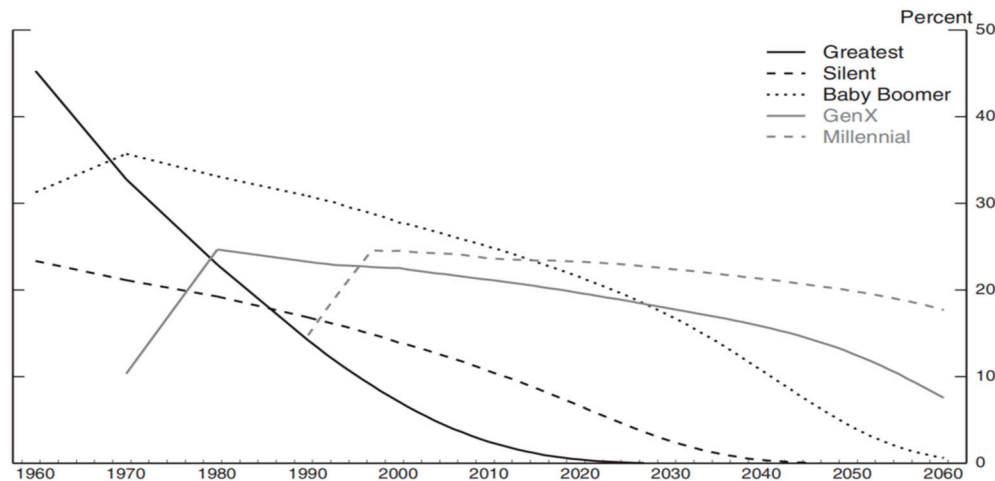
The uncertainty and ambiguity are high in the era of the “new normal” where the ab-normal has become commonplace [4]. Humans in modern society armed with advanced and innovative technologies seem to make rational and logical rational decision based on advanced technology and intellectual learning ability. However, in the era of new normal, where ambiguity and uncertainty are high, human tends to solve the problems by simplifying the complicated phenomenon in their convenient way of solving problems [5]. In other words, as the decision-making situation is more uncertain, complex, and obscure, human beings tend to make a decision depending on memories that come up first to him/her. Because of this environmental nature of modern society, the human being in the era of the “new normal” does not hesitate to make opposite decision for that mere differently framed same question [6]. This behavior of irrational, impulsive, and emotional decision-making can be approached as a concept of mental accounting in behavioral economics [7]. Innovation and technological advances represented by Big data, IOT, and AI, ironically, make human behavior more irrational, emotional, and even difficult to predict [8].

As technological progress accelerates, humans tend to reminisce and long for analogue memories. For example, modern people are familiar with smart devices online, but they eager to communicate with each other at the same time. What is unique is that modern people long for this analogue nostalgia. On the contrary, they tend to avoid direct contact and regular activities in real life, and tend to engage in online community activities since there is no restriction of time and space and anonymity is ensured. The Millennials, in particular, has grown in economic affluence compared to the previous generation in early childhood and adolescence, but it is a generation, at the same time, that lives with values distinct from those of the parents’ generation, by experiencing a frustrating reality in the society they have been facing from their independence as adults. In addition, the Millennials are less interested in offline group gathering or activities, while the generation has the characteristic of being actively participating in online activities and expressing their opinions prominently online. The term of Millennials first appeared in the book “Generations: the history of America’s future, 1584 to 2069” written by Howe and Strauss [9]. By analyzing data from the U.S. Census Bureau, some previous studies mostly adhere to the definitions of Millennials and earlier generations described in a number of Pew Research Center reports [10]. Millennials are people born between 1980/1981 and 1994/1995 [11–13] or 1999/2000 [12–15], with ages ranging from 18 to 38 years in 2018. The two generations that precede Millennials are Generation X, which describes individuals born between 1965 and 1980 (ages 38–53 years in 2018), and baby boomers, who are individuals born between 1946 and 1964 (ages 54–72 years in 2018). Older cohorts are the Silent Generation, which describes individuals born between 1928 and 1945 (ages 73–90 years in 2018), and the Greatest Generation, which describes individuals born between 1915 and 1928 (ages 90–103 years in 2018) [16].

Naturally, the size of each generation affects its influence on macroeconomic aggregates. Figure 1 uses census population (and projections) to plot the fraction of the total population in each generation. As the figure shows, Millennials became the largest generation in the United States in 2015, overtaking the baby boomer generation, which had been the largest for roughly 60 years. Interestingly, Generation X never attained the status of being the largest generation [16,17].

The research motivation behind this study can be described as follows. Reflecting its current size and prime working-age status, Millennials tend to be the focus of news articles and industry studies on the expected effects of generational transitions on economic activity. In the economics literature, the framework most often used to tackle questions about the age-related factors that affect households’ decisions on labor and consumption is the life-cycle consumption and permanent income models introduced in the 1950s [18,19]. As Millennials who possess different sets of workplace values and beliefs are entering all areas of society [20], the Millennials are now the main force that affects the entire family system, the social division of labor Economic growth, consumption, and other major areas. This group has reached a stage where they have a lot of accumulation in the family economy

and career influence. Such accumulation can refract the behavioral aspect of SNS usage. Compared with today's Silent Generation and Greatest Generation, whose vitality has begun to decline to some extent, the Millennials in the field are more influential and have more research value.



**Figure 1.** Population shares of selected generations. Source: the US Census Bureau, Population Division. The 2014 National Population Projections. See [16].

Millennials are the generation to document everything with social media [21], Millennials prefer living in urban areas well served by multiple travel modes and virtual connectivity, Millennials are now the largest portion of the US population, numbering 75 million in 2015, and their decisions will strongly influence the structure and function of urban regions for decades to come [22]. They currently make up over a quarter of the American population, and about a quarter of the European Union's. They are heavy web users, and, according to research by Youbrand, have an estimated purchasing power of \$2.45 trillion worldwide. Many of them are starting families and debuting careers. These are the people that will be making purchasing decisions, forming brand loyalties, and influencing their peers. Millennials are a big, powerful generation coming into their own, with high standards and unique characteristics. They are well worth of our attention [23]. The generation has shown a high university entrance rate. However, when this generation entered the workforce, it experienced social problems such as unemployment because of the global financial crisis. Accordingly, the average income of this generation is lower than before, and personal debt is even higher than other generations, resulted from college student loans. Thus, marriage is avoided by this generation and the desire for home ownership is also significantly lower, and more trust is given to online information such as Microblog, Facebook, YouTube, and SNS rather than traditional marketing channels conducted offline, in the physical world. Looking at Schneider's study [24], this generation reckons that meeting people offline is a waste of energy. They are familiar with brand collaboration that experiences multiple brands through a specific product or service, exhibiting multitasking behavioral characteristics. Despite Millennials' idiosyncrasies, little attention has been paid to the study of the consumer identities of this group [25]. Despite the fact that maintaining the continued usage of a social network service (SNS) can have strategic importance, major social network services are showing a slowdown in terms of the number of users [26]. Given the decreased numbers of revisiting users, research that investigates the key factors that influence continuance usage intention is crucial to those who devise marketing strategies for mobile social apps [27]. The sustainable use of social apps becomes important as business processes based on smart devices become important in creating business value. Thus, sustainability issues can be applied in developing factors affecting the continuous usage of social apps.

Previous studies examined SNS qualities [28], gratifications [29], flow [30], individual motivations (promotional motivation, altruism, innovativeness, and conformity) [27], and the research field itself, but investigations of the effects of individual motivations toward participating in a social community based on social exchange theory on relationship quality encompassing flow and social reward as they pertain to continuous usage are necessary. This study intends to fill this void. The difference in our approach is that we adopt a second-order construct to measure relationship quality, encompassing the two inherent variables of flow and social reward and testing the effects of four variables regarding individual motivations on relationship quality. Previous studies rarely considered the effects on relationship quality as a second-order construct encompassing flow and social reward. According to the early studies [21,31,32], the Millennials differ in their behaviors and consumption patterns from previous generations [33]. Especially, the consumption pattern of the Millennials shows a duality that shows the self-oriented tendency and the other-oriented tendency at the same time. The two tendencies are not confronted with each other, but rather related to each other. Those who are familiar with Internet use will expand their experiences by indirectly experiencing other people's experiences, maximizing their experiences when using SNS.

Therefore, in order to understand their duality and apply them to marketing strategies, it is necessary to understand the consumption patterns of the Millennials in a multifaceted and stereoscopic way. Therefore, in this paper, we will try to grasp consumption propensity of Millennials through understanding their SNS usages, which they use most as information acquisition and communication means.

## 2. Literature Review and Hypothesis Development

### 2.1. Millennials and Social Network Services (SNS)

Millennials have grown up in a time characterized by economic welfare, internationalization of company activities, and the development of the Internet and social networks [15]. Openness towards communication, digital competences and presence on numerous social networks are some distinctive characteristics of Millennials [34,35]. Accounting for one-third of the world's population [32], Shin and Lee predicted that the Millennials will take over the baby boomer generation, which was born after World War II and is now slowly retiring, in terms of driving world's consumption for the next 20 years [33]. The Millennials are technologically friendly and mobile-friendly because they have come into contact with digital technologies such as PC and smart devices since they were young. Therefore, the rate of sharing and communicating information using mobile shopping and SNS is high [24,32].

The academic definition of SNS by Boyd and Ellison is the most widely used as an academic concept of SNS [36]. According to their study, SNS is an Internet-based system in which an individual creates a public or conditional public profile within a restricted system to share information through connections with others, and to view connections made by others in the system. Although the characteristics of social networks vary depending on service types and contents, the core function of SNS is that it is possible to show profiles including members list in the system.

While different types of SNS contain different contents to another, there is a commonality that allows users to build social relationships on the network and share the network with other users [36]. In particular, since the Millennials shows a high usage of SNS, and it exhibits the characteristics of communicating and sharing information without barriers among countries, SNS can be a means to show the relationship formation, values, and behavior of Millennials [33].

### 2.2. Motivation to Use SNS, SNS Density, and SNS Centrality

SNS is a network service that supports interactions among individuals based on online, enabling users to create and spread contents on their own, and to build relationships by sharing contents with various kinds of people [37]. Many companies pay utmost attention

to identifying and integrating information and contents drifting on SNS. The main features of SNS are participating in content creation process, content accessibility, interactive communication, community building of common topic, and wide network [37,38]. The motivation to share knowledge can be based on enjoyment gained by helping others [39]. From a marketer's point of view, SNS can reach broad target customers at low media costs, get real-time feedback, build closer relationships, and become an effective means of word-of-mouth marketing. However, these efforts have been mainly focused on identifying consumers' general behavior tendencies rather than identifying their individual behaviors of the users. In addition, studies on the subdivision market targeted for the Millennials are extremely poor, and therefore targeted research is needed for the Millennials, which is becoming increasingly influential as a purchasing group [40].

Among the various SNS characteristics identified through previous studies on SNS characteristics, three characteristics of motivation, density, and centrality, which are closely related to this study [41,42], were derived from the data of six studies including the study of Yu and Kim [43], found that if people have the optimal experience commonly known as the concept of flow, they want to share expertise and important information online. We believe that using SNS to acquire and share professional knowledge and important information will make users feel fun. Table 1 shows many of the flow characteristics previously summarized by the researchers.

**Table 1.** Users' motivations to use social network services (SNS).

Users' Motivations						Researchers
Social Support	Motivation	Centrality	Self-Expression	Entertainment	Density	Social Interaction
	•			•		•
			•			•
•		•				
	•				•	

•: The range of Users' motivation involved by the previous researchers.

**Hypothesis 1.** *Motivation to use SNS will be positively associated with SNS flow.*

In the meantime, many recent studies on SNS show that excessive use of SNS may cause negative consequences, resulting in SNS addiction and leading to personal isolation rather than forming relationship. However, for users with a clear or self-centered intrinsic motivation of SNS activity, given the importance, role, and social reward in the social network, addiction may be significantly lowered, positive communication may be even enhanced and intention to reuse of SNS may be improved as well [38,40].

The leading factor influencing the social reward in the SNS is the influence of the individual. This is because people with relatively high status or influence on social networks can acquire better social capital or rewards than those who do not [46–48]. The formation of a social network online is easier than offline, so the opportunity for social capital formation seems fair, but in reality, digital divide is so severe that online may lead to social inequality. The structural nature of the network in which an individual is involved has an important impact on the access and acquisition of social capital. In particular, since the Millennials is a generation familiar with communication and information sharing through SNS activities, there is a need to identify whether the social capital formed by these generations can be differentiated from other generations. In order to do this, we should look into the characteristics of the network that influences the social capital formation of the Millennials. The most typical network characteristics can be described as density and centrality [49–51]. Density refers to the degree of linkage between network members, and tends to increase with higher linkages among network members [49,52]. When the density becomes higher,

the degree of strength of the linkage accordingly becomes stronger [52,53]. In addition, if the density of the network to which the individual belongs is high, information exchange is active in the network, the spreading degree is strong, and cognitive and emotional support among network members becomes possible. The fact that the density on the net positively affects the social capital formation of the network members suggests that the density among the members is high and the possibility of forming a new network is expanded at the same time [49,54].

**Hypothesis 2.** *Motivation to use SNS will be positively associated with SNS social reward.*

Centrality refers to how much more structurally favorable a person is in a network compared to other members in the network. Individuals with high centrality are at the center of the information flow in the network and thus have the advantage of controlling or extending the flow of communication [54,55]. In addition, individuals occupying high centrality are easy to access to members in the network and can obtain useful information at lower cost. In other words, the higher the individual's centrality within a particular social network, the greater the emotional attachment to the community. This attachment affects positively the relationship with the community and the intention to use SNS [56]. As shown in various previous researches, users occupying the central position in the network are shown to be able to access and utilize better social capital than users with lower centrality. Therefore, it can be predicted that high individual's centrality within the network can have a positive impact on social capital and SNS experiences and usages. In addition, the Millennials are acquiring and utilizing information by actively participating in SNS activities. Therefore, it is necessary to examine the SNS usage of this generation, focusing on the effects of motivation, density, and centrality on flow, social reward, and intention to continuous usage formed through SNS experiences.

**Hypothesis 3.** *SNS density will be positively associated with SNS flow.*

### 2.3. SNS Flow and SNS Social Reward

The concepts of social reward or social capital are covered not only in business administration field but also in various disciplines, such as sociology, psychology, political science, and economics [47–49]. The concept of social capital, primarily in sociology or psychology, originates from social relationships and includes the concept of social capital and monetary gain that are gained by the continuity of relationships [36]. Social capital in political science is used as a concept of social value transmission that sustains social development and enhances the power of political groups. In economics, studies are mainly conducted in connection with the economic development of countries and communities.

**Hypothesis 4.** *SNS density will be positively associated with SNS social reward.*

In this way, the concept of social capital, which is covered in various disciplines, differs slightly from concept to concept, but there are two common perspectives for social capital. First, whether it is online or offline, it comes from the formation of social networks and group relationships. Second, the concept of social capital that can be measured from the standpoint of social members needs to be divided into individual levels and group levels. This is because when the members perceive a social relationship, psychological resistance may be caused when social capital at the individual level may collide with social capital at the collective level [57–59].

**Hypothesis 5.** *SNS centrality will be positively associated with SNS flow.*

In many previous studies [21,32], the characteristics of the Millennials are that the most important thing for these generations is their own, they aim for personal life, and

they value their current happiness rather than the future, showing self-orientedness and present-orientedness.

Therefore, this study focuses on the individual dimension of the social capital concept for the Millennials, distinguishing it from the previous generations. The concept of social capital is limited to the social reward, which means the acquisition of psychological capital, except for the monetary compensation at the individual level. Social reward in this study, in other words, refers to the resources that can be obtained from the members of the SNS, which includes compensation for information acquisition, and personal emotion obtained from the SNS relationship.

As mentioned above, based on the previous researches related to SNS characteristics that are widely used by the Millennials as a means of acquiring, sharing, and communicating information, it is possible to predict that the motivation to use and network structural characteristics (centrality, density) may affect the SNS usage behavior. Therefore, this study suggests the following research hypotheses based on the previous research results.

**Hypothesis 6.** *SNS centrality will be positively associated with SNS social reward.*

#### 2.4. Intention to Continuous Use SNS

Csikszentmihalyi and Lefevre [60] argue that flow is the holistic feeling that is experienced by people when they are totally involved in an activity. They also describe people's sensation when they are actively participating and immersed in an activity. Flow can be experienced in a variety of common activities such as reading, watching a movie, or engaging in sports [61]. It is also suspected that those people who enjoy flow experience may develop a tendency to repeat the behavior during an activity [62]. In a flow state, time may seem to stand still when people are engaged in an activity [63]. Regardless of the specific generation, the ultimate reason that consumers use SNS is because SNS maximizes users' satisfaction by providing better value to users, thereby inducing continuous use SNS [41]. The intention to use a particular service depends on the user's assessment of the service, which, in turn, affects the decision to continue using the service. In order to create sustainable value for the future and to generate profits, strategies that enhance the satisfaction or reuse intention of users who use a specific service are needed and the investigation should be continuously carried out [48,64,65].

**Hypothesis 7.** *SNS flow will be positively associated with Continuous Intention to Use.*

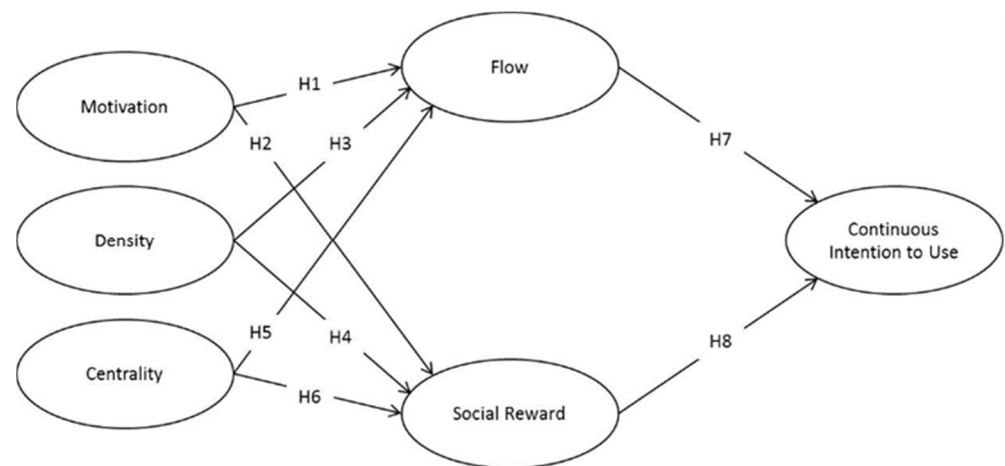
In this research, we operationalized the concept of flow with two dimensions: perceiver enjoyment and concentration, which are also the main mediator variables in our research model. Perceived enjoyment and concentration are believed to be directly linked to SNS usage. As shown in Table 2, many studies have found that flow experience or flow state has a positive effect on attitude (online games [66], mobile social networking services [67], and online lesson [68]). In our research, we also proposed that users experiencing flow in playing SNS usage gain a positive attitude to this continuous intention to use.

**Hypothesis 8.** *Social reward will be positively associated with continuous intention to use.*

Therefore, in this study, we propose a research hypothesis to investigate the relationship among flow, social reward, and intention to continuous usage based on the previous researches that identify the influential factors of SNS service usage. The research model is shown in Figure 2.

**Table 2.** Prior research on the characteristics of flow [69].

Context	Summary of Flow	Researchers
Happiness and how to find it	Balance challenge and skill in a task will lead flow, a task should have clear goals, and a task provides immediate feedback	[60]
Social media use	Enjoyment, concentration, challenge, control, and curiosity	[61]
Flow in human-computer interactions	Intrinsic interest, curiosity, and a combination of intrinsic interest and curiosity	[62]
Online consumer behavior (both shopper and computer user)	Intrinsic enjoyment, perceived control, and concentration/attention focus	[70]
Players' loyalty in mobile game applications	Perceived enjoyment and attention focus	[71]

**Figure 2.** Research model.

### 3. Research Methodology

#### 3.1. Data Collection and Research Method

In this study, a survey has been conducted through the Google survey and offline survey questionnaires from 2 August 2018 to 28 August 2018, for Millennials with at least one SNS subscription and experience. A total of 221 questionnaires have been collected. Based on the previous studies, 165 respondents whose ages range from the 18-year-old to 38-year-old, which can be defined as Millennials, were selected. Out of 165 questionnaires, 161 were finally used for analysis after eliminating the questionnaires with irrelevant and missing answers.

For the empirical purpose of this study, SPSS 25.0 has been used to perform confirmatory factor analysis, correlation analysis, path analysis, and direct/indirect effects analysis using of bootstrapping. Except for the questions of respondents' demographic characteristics, all constructs including motivation to use SNS, density, centrality, flow, social reward, and intention to continuous usage have been measured by 7-point Likert scales.

#### 3.2. Measures

In order to achieve the purpose of this study, the word structures of the questions were improved in order to enable straightforward responses. The items used in the questionnaire are shown in Table 3. Based on the results of previous studies, the items measuring motivation construct that have been proved in the previous studies to have significant effects on Intention to Continuous Usage have been hired in this study [37,38,41,64,65,72]. In addition, the constructs measuring characteristics of SNS relationship (density and



centrality) have been edited and adopted from the previous studies of Chun [73], Shin et al. [45], and Panda et al. [44]. The items measuring SNS usage behavior (flow, social reward, and intention to continuous usage) were modified and supplemented from the items used in the previous studies of Lin et al. [46], Kwak et al. [41], Hwang et al. [65], Chang and Zhu [74], and Williams [75].

**Table 3.** Measurement.

Constructs	Measurement Items	Researchers
Motivation	<ol style="list-style-type: none"> <li>1. Use SNS to get new information and ideas</li> <li>2. Use SNS to find new content</li> <li>3. Use SNS to acquire and share expertise and important information</li> <li>4. Use SNS to seek for advice or information</li> <li>5. Use SNS to share information and knowledge I have for other users</li> </ol>	[37,72]
Density	<ol style="list-style-type: none"> <li>1. The degree of relationship between members of SNS</li> <li>2. The degree of communication among SNS members</li> <li>3. The degree of intimacy among members of the SNS</li> <li>4. The degree of sharing of interests among SNS members</li> </ol>	[44,45]
Centrality	<ol style="list-style-type: none"> <li>1. The degree of influence on the SNS I use</li> <li>2. The degree of importance of roles on the SNS I use</li> <li>3. The degree of activity on the SNS I use</li> <li>4. The degree of connection on the SNS I use</li> </ol>	[44,73]
Flow	<ol style="list-style-type: none"> <li>1. The degree of enjoyment while doing and using SNS</li> <li>2. The degree of concentration when using SNS</li> <li>3. The degree of time distortion and telepresence experienced while experiencing SNS</li> </ol>	[41]
Social reward	<ol style="list-style-type: none"> <li>1. Intimacy to people who communicate through SNS</li> <li>2. Satisfaction with SNS communication</li> <li>3. The degree acquiring personal information through SNS</li> <li>4. Providing information through SNS to help others' private interests</li> <li>5. Acquisition of professional knowledge, information, and interest in communication through SNS</li> </ol>	[46,74,75]
Continuous intention to use	<ol style="list-style-type: none"> <li>1. Willing to use the current SNS in the future</li> <li>2. Willing to continue to use the current SNS</li> <li>3. Willing to recommend the current SNS to others</li> <li>4. Future attachment to the current SNS</li> </ol>	[67,68]

## 4. Results

### 4.1. Characteristics of Respondents

As shown in Table 4, 65 (40.4%) of the sample respondents are males and 96 (59.6%) are females. In the question about marital status, 115 (71.4%) are single and 46 (28.6%) are married, showing the proportion of single is relatively high. The most frequently used SNS service turned out to be Instagram (57.8%), Facebook (36.4%), and YouTube (18.2%) in descending order. In addition, the frequency of SNS access was 72.6% over three times a day. In addition, for the SNS access frequency, 72.6% of the respondents access to their SNS at least three times a day. For the question on time of SNS daily usage showed that 41 (25.5%) used 30 min a day, 54 (33.5%) used 1 h a day, and 36 (22.4%) used 2 h a day, showing highest proportion of 1-h average usage per day. In addition, the most common activities for SNS users are viewing the posts (62.1%) and clicking "like" (15.5%).

**Table 4.** Characteristics of respondents.

Division	Item	Frequency	Rate (%)
Gender	Male	65	40.4
	Female	96	59.6
Marital status	Single	115	71.4
	Married	46	28.6
Age	10s	8	5.0
	20s	79	49.1
	30s	74	46.0
Most frequently used SNS services	Facebook	36	22.4
	Instagram	93	57.8
	Twitter	1	0.6
	KakaoStory	5	3.1
	YouTube	18	11.2
	Naver Band	1	0.6
	Blog	4	2.5
	Others	3	1.9
Number of daily access to SNS	Once	13	8.1
	Twice	31	19.3
	3 or 4 times	26	16.1
	5 or 6 times	30	18.6
	More than 7 times	61	37.9
Time of SNS usage per day	30 Mins or less	41	25.5
	About 1 h	54	33.5
	About 2 h	36	22.4
	About 3 h	16	9.9
	More than 4 h	14	8.7
Users' major activities in SNS	View followers' posts	100	62.1
	Clicking "like"	25	15.5
	Posting photos	11	6.8
	Posting videos	5	3.1
	Advice (counseling)	3	1.9
	Others	17	10.6
Total		161	100

#### 4.2. Reliability and Validity

This section is not mandatory but can be added to the manuscript if the discussion is unusually long or complex. In this study, confirmatory analysis to test reliability and validity has been conducted before confirming relationships among constructs. The results are shown in Table 5.

The goodness-of-fit index for the research model meets the required level of fitness for the measurement model ( $\chi^2 = 464.894$ ,  $DF = 245$ ,  $P = 0.000$ ,  $RMR = 0.057$ ,  $RMSEA = 0.075$ ,  $GFI = 0.826$ ,  $AGFI = 0.770$ ,  $IFI = 0.923$ ,  $TLI = 0.904$ ,  $CFI = 0.921$ ) [76].

As shown in Table 5, Composite Reliability and AVE values were used to confirm reliability and validity. As a result, composite reliability of the components, including motivation, density, centrality, flow, social reward, and intention to continuous usage, were 0.922, 0.890, 0.895, 0.761, 0.899, and 0.900, respectively, and all the AVE values of the components range from 0.519 to 0.704. Therefore, it can be judged that it meets the reliability and validity criteria proposed by Hair et al. [77].

**Table 5.** Convergent validity and reliability.

Constructs	Variables	Estimate	Std. Estimate	S.E.	C.R.	Label	Composite Reliability	AVE
Motivation	M5 <sup>a</sup>	1	0.626				0.922	0.704
	M4	1.232	0.843	0.146	8.418 **	par_1		
	M3	1.209	0.77	0.153	7.910 **	par_2		
	M2	1.205	0.737	0.157	7.659 **	par_3		
	M1	1.222	0.814	0.149	8.222 **	par_4		
Density	D4 <sup>a</sup>	1	0.811				0.890	0.670
	D3	0.953	0.814	0.084	11.332 **	par_5		
	D2	1.065	0.867	0.087	12.178 **	par_6		
	D1	0.717	0.722	0.074	9.734 **	par_7		
Centrality	C4 <sup>a</sup>	1	0.723				0.895	0.683
	C3	1.087	0.798	0.086	12.662 **	par_8		
	C2	1.209	0.938	0.101	11.958 **	par_9		
	C1	1.17	0.901	0.101	11.553 **	par_10		
Flow	F3a	1	0.792				0.761	0.519
	F2	0.928	0.617	0.138	6.703 **	par_11		
	F1	0.749	0.618	0.111	6.744 **	par_12		
Social reward	R5 <sup>a</sup>	1	0.782				0.899	0.642
	R4	1.163	0.871	0.08	14.474 **	par_13		
	R3	1.035	0.723	0.109	9.502 **	par_14		
	R2	0.975	0.756	0.103	9.503 **	par_15		
	R1	0.947	0.745	0.095	9.949 **	par_16		
Continuous intention to use	I4 <sup>a</sup>	1	0.771				0.900	0.694
	I3	0.846	0.768	0.082	10.297 **	par_17		
	I2	1.073	0.865	0.092	11.708 **	par_18		
	I1	1.045	0.85	0.09	11.563 **	par_19		

Notes:  $\chi^2 = 464.894$ ,  $DF = 245$ ,  $p = 0.000$ ,  $RMR = 0.057$ ,  $RMSEA = 0.075$ ,  $GFI = 0.826$ ,  $AGFI = 0.770$ ,  $IFI = 0.923$ ,  $TLI = 0.904$ ,  $CFI = 0.921$ , a: Reference variable, \*\*  $p < 0.01$ .

In addition, as suggested by Hair et al. [77], the discriminant validity has been assessed by comparing the correlation with the square root of AVE. The discriminant validity was satisfied when the square root of AVE of all factors exceeded the correlation value of each construct ( $p \leq 0.01$ ) as shown in Table 6.

**Table 6.** Correlation Matrix

Construct	Mean	Std. D.	1.	2.	3.	4.	5.	6.
1. Motivation	3.679	0.734	0.839					
2. Density	3.216	0.832	0.339 **	0.819				
3. Centrality	2.464	0.941	0.332 **	0.552 **	0.826			
4. Flow	2.793	0.736	0.234 **	0.259 **	0.416 **	0.720		
5. Social reward	3.113	0.804	0.662 **	0.458 **	0.534 **	0.405 **	0.801	
6. Continuous intention to use	3.182	0.814	0.558 **	0.424 **	0.573 **	0.449 **	0.690 **	0.833

Notes: \*  $p \leq 0.05$ , \*\*  $p \leq 0.01$ .

#### 4.3. Structural Analysis and Hypotheses Testing

The purpose of this study is to understand the characteristics and behaviors of the Millennials who are using SNS. For this purpose, a covariance analysis was conducted to test hypotheses on the causal relationship among motivation, density, centrality, flow, social reward, and intention to continuous usage.

Figure 3 and Table 7 present the test results of the structural model. As shown in the table, goodness-of-fit index for the research model meets the required criteria of fitness for

the measurement model, suggested by the studies of Rose et al. [78], Preacher et al. [79], and Becker et al. [80] ( $\chi^2 = 490.691$ ,  $DF = 251$ ,  $p = 0.000$ ,  $GFI = 0.891$ ,  $AGFI = 0.838$ ,  $RMR = 0.060$ ,  $TLI = 0.916$ ,  $CFI = 0.924$ ,  $RMSEA = 0.072$ ; \*  $p < 0.05$ , \*\*  $p < 0.01$ ).

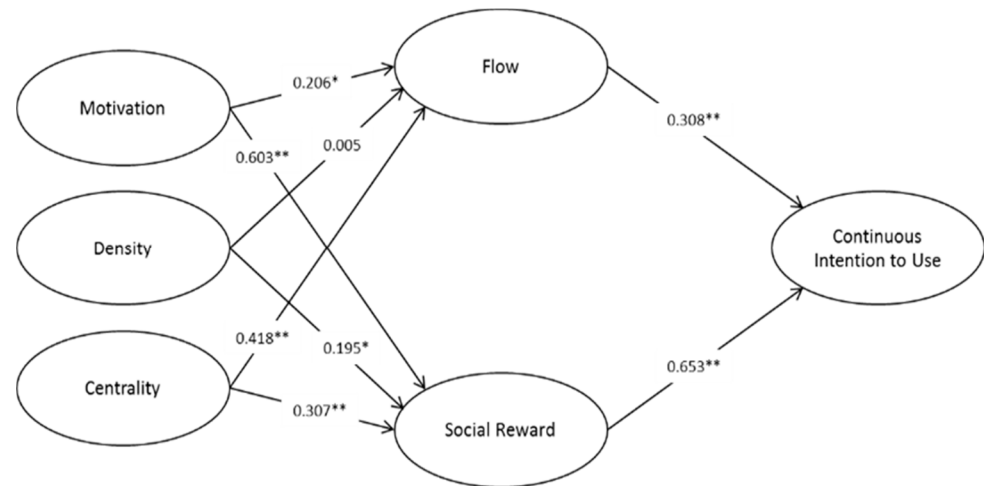


Figure 3. Results of structural analysis. \*:  $p$ -value  $< 0.05$ , \*\*:  $p$ -value  $< 0.01$ .

Table 7. Results of path analysis and hypotheses testing.

Hypothesis	Path	Estimate	Std. Estimate	S.E.	C.R.	Result
H1	Motivation → Flow	0.224	0.206	0.115	2.134 *	Accepted
H2	Motivation → Social reward	0.751	0.603	0.118	6.337 **	Accepted
H3	Density → Flow	0.004	0.005	0.088	0.048	Rejected
H4	Density → Social reward	0.142	0.195	0.065	2.082 *	Accepted
H5	Centrality → Flow	0.368	0.418	0.100	3.686 **	Accepted
H6	Centrality → Social reward	0.284	0.307	0.074	3.814 **	Accepted
H7	Flow → Continuous intention to use	0.342	0.308	0.090	3.805 **	Accepted
H8	Social reward → Continuous intention to use	0.689	0.653	0.093	7.393 **	Accepted

Notes:  $\chi^2 = 490.691$ ,  $DF = 251$ ,  $p = 0.000$ ,  $GFI = 0.891$ ,  $AGFI = 0.838$ ,  $RMR = 0.060$ ,  $TLI = 0.916$ ,  $CFI = 0.924$ ,  $RMSEA = 0.072$ ; \*  $p < 0.05$ , \*\*  $p < 0.01$ .

The results of hypothesis testing using path analysis are as follows. First, as the positive (+) linkages of motivation to use SNS with both of flow and social reward have been confirmed, i.e., H1 ( $\beta = 0.206$ ,  $p < 0.05$ ) and H2 ( $\beta = 0.603$ ,  $p < 0.01$ ) have been accepted. Second, in the relationship of density with flow and social reward in SNS, H3 ( $\beta = 0.005$ ,  $p = 0.962$ ), which assumed a positive linkage between density and flow, has been rejected since it did not meet the significance level, while H4 ( $\beta = 0.195$ ,  $p < 0.05$ ), which assumed a positive linkage between density and social reward, has been adopted. Third, as all of the influences of centrality on flow and social reward have been positively (+) associated, H5 ( $\beta = 0.418$ ,  $p < 0.01$ ) and H6 ( $\beta = 0.307$ ,  $p < 0.01$ ) have all been accepted. Fourth, in the relationship among flow, social reward, and intention to continuous usage, as flow and social reward have positively (+) linked with intention to continuous usage, both of H7 ( $\beta = 0.308$ ,  $p < 0.01$ ) and H8 ( $\beta = 0.653$ ,  $p < 0.01$ ) have been confirmed and concluded with results of the previous studies. Among the dependent variables, all paths are significant. This indicates that when users feel the flow and social reward with mobile social, they are likely to continue using the mobile social apps.

#### 4.4. Direct and Indirect Effects by Performing Bootstrapping

In general, if the size of the sample is small or population from which the sample is derived is biased to the left or right, then sampling distribution may not be a normal distribution. Therefore, if it is difficult to assume that the sampling distribution for the mediating effect statistics will be normal distribution or t-distribution, then it is preferable to use the bootstrap method [79]. In this study, the sample is limited to the Millennials. Therefore, followed by path analysis using bootstrapping, a direct and indirect effects analysis between each component has been performed to focus more on the role of flow and social reward components used as mediators in the structural model.

The direct effect of bootstrapped covariance decomposition is defined as that the independent variable has a direct effect on the dependent variable, while the indirect effect is defined as that the independent variable influences the final dependent variable through one or more parameters [77,79]. All independent variables except density have direct effects on the dependent variable. Moreover, the density has a direct effect on the social reward at the significance level ( $p < 0.05$ ,  $\beta = 0.195$ ), and social reward has a direct effect on intention to continuous usage at significance level ( $p < 0.01$ ,  $\beta = 0.653$ ). However, the indirect effect of density on the dependent variable, intention to continuous usage, was not significant ( $p = 0.176$ ,  $\beta = 0.129$ ).

The results of this study indicate that for the Millennials, the empathy, mental or emotional support from the other members with high SNS usage level increases the attachment or intention to continuous usage. This result is consistent with the claims of previous studies that reveal the Millennials duality of the self-display tendency and the other-oriented tendency [32,33,76].

For the Millennials who engage in SNS activities, not merely self-display or narcissism, but the others' evaluation on them may dominate their behaviors. Narcissism tends to appear stronger for self-defense. Therefore, the more the conscious evaluation of others, the greater the narcissism tendency. In other words, the narcissistic behavior of the Millennials can be seen as an action defending and comforting them. Both constructs of flow and social reward have been confirmed as significant mediators in this study, but this result shows that social rewards particularly in the Millennials plays a greater role as a mediator. To ensure their sustainable behavior, however, the social networks providers should focus on efforts to improve the level of sustainable use intention by enhancing the social presence and level of flow.

## 5. Conclusions

### 5.1. Summary of the Results and Managerial Implications

The Millennials are a connecting link between the past and the next generation. They play a more important role in society now. In the United States and a number of European nations, whether they have the right to vote or in speech, they occupy a more important position in politics and economy. They are more influential than Baby Boomers or Generation Z in terms of speech or influence on the Internet, especially the habits of this generation in using the Internet [81,82], their influence on Internet-related network activities and life rules, their adaptation, and their influence on these rules in turn. This era is a link between the past and the next generation in terms of rules. Rules are restricting them. Rules have been gradually established from their generation. Even in some countries, Millennials are the first group of data natives [83,84]. After entering the social network system, they form rules through their activities. Rules act on them, and on the contrary, they promote the reconstruction of rules [85,86].

Since the global financial crisis, the most influential generation in the world is the Millennials [87], whose consumption behaviors are distinguished from previous generations in many respects [32,62,76]. Millennials will comprise three-quarters of the global workforce by 2025, so their growth potential is significant enough to affect world's market in any field [88–90]. Therefore, this study attempts to identify behavior patterns of the Millennials, which are distinguished from the previous generations through the social

networks that they have frequently used, and to gain insight for corporate and marketing strategies development for the generation.

The results of the study are summarized as follows. The results suggest practical implications to the marketers to grasp the Millennials attention.

First, the most common SNS types used by Millennials are Instagram, Facebook, and YouTube in order. Although there are many SNS types that provide various contents, Instagram, Facebook, and YouTube have common features that attract users. The mentioned SNS types have much higher openness to the users in terms of the usage of the SNS, compared to other SNS types such as Blog, Pinterest, and Naver Band. Moreover, they are also relatively easy to enter or exit the SNS activities and have the advantages of gaining information, content, and social rewards that users seek for. The Millennials tends to pursuing individualistic values and they are unwilling to be entangled in something that they do not want to engage. In this context, the Millennials prefer SNS activities such as Instagram, YouTube, and Facebook. In addition, considering that the SNS access frequency in 56% of the generation is more than 5 times per day and the time of SNS usage per day in 59% of the users is 30 min (25.5%) to 1 h (33.5%), it shows the characteristics of the Millennials collecting information and contents, sharing posts related to oneself, and clicking “like” to the posts they like.

Second, the result of the study shows that the relationships of the motivation to use SNS with flow and social reward were all significantly associated. This result is consistent with the results of previous studies that the more the users of SNS as well as the Millennials are motivated to use, the more the favorable attitudes and behaviors can be formed for the SNS they use.

Third, as a result of the study on the linkages among SNS density, flow, and social reward, there is significant relationship between density and flow, while there is a significant relationship between density and social rewards. According to previous researches, as the density in the SNS is high, the network connection and diffusion are also high and the emotional and affective compensation is high as well. However, what Millennials want to achieve through SNS activities is not to expand their relation boundary, but to meet personal needs and to pursue limited interaction. Therefore, the concept of density, which is the degree of relationship through SNS, can be seen distinctively from the concept of involvement in a specific SNS service. In that SNS density shows positive linkage with social reward, on the other hand, it can be seen that as the SNS density gets higher, the desire for recognition from other people becomes larger at the same time, and they desire to be displayed by daily postings and to be “liked” by clicking “like” from other people.

Fourth, from the result of the study, SNS centrality has significant effects on flow and social reward. In other words, in the case of members with higher influence on SNS, it is more likely to receive social rewards within the community than other members, and it is also likely to become more involved in SNS activities.

Millennials’ behavior habits on the Internet have a considerable impact. One is their own value. They are now a mainstay and a very important position in economic and social activities, including economic activities, social activities, and network activities. Whether in the family or in the society, they all have a certain right to speak, including economic foundation, the enthusiasm and ability to participate in political activities and economic activities in society [69]. Therefore, their habits and behaviors in life and on the Internet, their expressions, their personalities, their integrity, and all other behaviors are very important. It has a direct impact on the people around from real life to the Internet, the new generation, the development of the habit of a new group of social media users in the future, the habits of online life, the habits of using social platforms, and even the formation and revision of social platform rules [30,70]. Along with the generation of the Internet and the goal to pursue pure freedom of social platform, with the emergence of network violence or related negative problems, a variety of Internet-related norms gradually appear in accordance with their behavior and the practical problems, from technical standards to behavioral norms, some published procedures, and even more some habitual behaviors

that are not formed to norms on the Internet. In short, it is the spontaneous formation of behavioral norms [71], which are gradually accumulated and formed through this generation, and it has a major impact on the subsequent development of the Internet and social platform.

Fifth, the relationship among SNS flow, social reward, and intention to continuous usage was found to be significant. This indicates that the favorable attitude naturally formed in the process of experiencing the social network activity positively affects the intention of continuous usage for a particular social network, suggesting that high flow and social reward through the experience of specific SNS activities can form attachment to the SNS and intention to continuous usage. Thus, companies with differentiated services and contents tailored to the Millennials can have a strategic advantage in attracting the Millennials.

### *5.2. Theoretical Implications*

In additions to managerial implications, the theoretical implications of this study are as follows.

First, many of the reasons why SNS users engage in social networking activities are to form and strengthen relationships among members through activities. Therefore, it is needed to determine what factors affect the loyalty and intention to continuous use SNS. In this context, an empirical analysis has been conducted from the study by limiting the target users to the Millennials. It is expected that investigating to a specific target group rather than examining too many user groups will help with identifying the characteristics of the subdivision group of the Millennials and accordingly establishing strategies targeting the subdivision group.

Second, by analyzing direct and indirect effects in the relationship among motivation to use SNS, SNS density, centrality, flow, social network, and intention to continuous usage, direct effects, indirect effects, total effects and mediating effects among the constructs have been demonstrated. Hereby, it has been proved that social reward plays a critical mediating role in SNS usage of the Millennials. It reveals that the desire of the individual dimension for the Millennials can be transformed into a relational desire of conformity with others. It is suggested that for the Millennials, empathy or conformity with other members in SNS can be more important factors for strengthening relationship than density, centrality, or trust, which have been known as important factors of strengthening relationship in online network.

Third, the findings that there is no significant relationship between SNS density and flow differ from the results of previous studies. It is interesting to note that the Millennials suggests that even if the SNS density is high, it does not affect the involvement in personal network activities such as flow.

Through the study, we expect that this study will help with expanding the scope of future studies on SNS usage as the study focuses on the Millennials and examines the characteristics and behaviors of SNS usage.

### *5.3. Limitations and Future Research Perspectives*

The study has several limitations as well as areas of future research on social apps. The first limitation concerns the characteristics of the participants. Future research should examine a greater range of age groups and education levels since millennials comprise a larger set than only those born during the 1990s. In particular, this line of research would benefit from investigations considering Millennials without a college education to account for different exposures to usage behavior and its manifestations. Second, different effects of user motivations and social capital can be suggested according to different user groups in terms of gender, age, and occupation. Differences in SNS characteristics and usage behavior attitudes toward social apps according to different user groups can also inform future research issues. This will help to suggest promising marketing strategies to promote the continued use of social apps to various user groups. Third, the research

model can be expanded by adding new variables related to sustainability, such as social participation, community engagement, and social engagement with sustainability in future studies. As social networking services (SNSs) develop rapidly and become mature, Internet has stepped into the era of social networking. According to 2018 China Internet Network Information Center, the number of Chinese SNS users has exceeded 1000 million. It is possible to analyze the path between the usage behavior of social network services and the continued use intention of SNS users in the Chinese Millennials.

The only way to really determine whether what we think are generational differences actually is by doing large-scale prospective studies over decades, making sure that the studies include large and diverse generational samples that accurately reflect the birth cohort from which they come. Data will need to be gathered intermittently over decades so that we can determine whether shifts in behavior, expectations, and attitudes are a result of generation, age, life stage, maturation level, or environment [91].

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