# Tell me who you are and I will tell you which SNS you use: SNSs participation

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## Abstract

**Purpose** – Social networking sites (SNSs) have become an essential part of our lives. The purpose of this paper is to explore how demographic variables, SNS importance, social and informational usage, and personality traits (extroversion/introversion, openness, neuroticism, internal and external locus of control) can explain participation frequency of the four biggest SNSs in Israel: Facebook, WhatsApp, Instagram and Twitter.

**Design/methodology/approach** – The research was conducted in Israel during the Fall semester of the 2017–2018 academic year and encompassed 244 students. Researchers used six questionnaires to gather data: a demographic questionnaire, a participation frequency questionnaire on four different SNSs, four SNSs importance questionnaire, social and informational usage on four different SNSs questionnaire, personality questionnaire (extroversion, openness and neuroticism) and the locus of control questionnaire.

**Findings** – The findings revealed that different social network sites play distinct roles for various individuals. WhatsApp, the most frequently used platform, is used more by women and people with internal locus of control. Facebook is more frequently used by open people and Instagram is more frequently used by women, younger adults and neurotic people. Twitter is more frequently used by men. In addition, for all SNSs, the higher the social and informational usage is, the more important the SNSs are to the users, which significantly explains participation frequency.

**Originality/value** – The differences between social networks can be evidence that each social network serves a different group and does not compete with other SNSs. This may well explain why many people make use of several social networks and have a tendency to move from one to another.

**Keywords** Gender, Participation, Social networks, Personality, Locus of control, SNS importance

**Paper type** Research paper

## Introduction

Social networking sites (SNSs) have become an essential part of our lives. They enable participants to create personal profiles, present their identities, associate with others, view, share, upload and comment on photos, messages, videos, and other content posted on their newsfeeds (Boyd and Ellison, 2007; Phua and Jin, 2011). According to the statistical portal Statista (2018), Facebook has more than 2.2bn active monthly users, WhatsApp has 1.5bn active monthly users, Instagram has more than 800m active users and Twitter has 330mn active users. The Pew Research Center determined that as of early 2018, Facebook and YouTube dominated the American social media landscape. However, young Americans between the ages 18 and 24 use also Snapchat (around 78 percent), Instagram (around 71 percent) and close to half (about 45 percent) are Twitter users (Smith and Anderson, 2018).

Israeli Internet Report (2018) stated that WhatsApp (87 percent) and Facebook (80 percent) are the two dominant social network sites among Israeli adults, while Instagram has more active users (72 percent) than Facebook (63 percent) among young Israelis. Yet, WhatsApp is the most popular social network in Israel: 87 percent of adults and 93 percent of young Israelis use it. As the current study was carried out in Israel, researchers chose to focus on the four most popular SNSs there: Facebook, WhatsApp, Instagram and Twitter.

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Comparing the four platforms, Facebook, Twitter and WhatsApp focus on text, visual and audiovisual content. Instagram concentrates on sharing pictures enhanced by filters (Waterloo *et al.*, 2017). Karapanos *et al.* (2016) suggested that Facebook affords asynchronous communication practices, while in WhatsApp – a controlled environment – people experience a high sense of presence in their communication with others. Moreover, Facebook can be considered a semi-public setting composed of strong and weak ties where individuals keep in touch with old friends and make new ones (Amichai-Hamburger and Hayat, 2017; Ellison *et al.*, 2007; Joinson, 2008; Raacke and Bonds-Raacke, 2008). WhatsApp can be characterized as a private platform that is used mainly to interact with close friends and family (strong ties), opening up the possibility for intimate conversation (Karapanos *et al.*, 2016). Instagram is more public and is usually composed of weak ties (Waterloo *et al.*, 2017). However, Twitter is primarily a micro-blogging service that enables posting of texts and links to stored photos (Kwon *et al.*, 2014).

Various studies were carried out comparing different social platforms relating to diverse variables. The current research delved into the participation frequency on the four big SNSs in Israel (Facebook, WhatsApp, Instagram and Twitter), as participation is a crucial factor to the existence of the social network (Faraj *et al.*, 2008). The participation frequency was found to be strongly related to the degree of motivation individuals possess (Bronstein *et al.*, 2016). This can be explained by the uses and gratification theory, which today can be applied to social media and how it is used to fulfill the needs of various users with different goals (Smock *et al.*, 2011). This framework attempts to explore how different people use the same media platforms for different purposes in order to satisfy their psychological and social needs (Katz, 1959). For example, Aharony (2015) found that the U&G paradigm, as well as individual differences, affects WhatsApp satisfaction and duration of usage.

In accordance with this notion, we explored how the following variables: personality traits (extroversion/introversion, openness, neuroticism, internal and external locus of control), social and informational usage, SNS importance and demographics (age and gender) explain participation frequency on these platforms. This study considers a number of media outlets, rather than just one, since these outlets serve different goals for different people.

It is interesting to map the usage on various SNSs, and it is important to explore different SNSs participation frequency. Thus, when individuals or organizations understand who uses a certain social media platform, they will be able to convey a specific message to those people, while using their favorite, appropriate social media channel.

The objectives of this study are: to what extent do the next variables explain the participation frequency on these four platforms?

(1) demographic variables (age and gender);

(2) personality traits (extroversion/introversion, openness, neuroticism, internal and external locus of control);

(3) social and informational usage; and

(4) SNS importance.

## Literature review

### *Social network sites (SNSs)*

Various researchers investigated the use of distinct social sites platforms. Hargittai (2007) was one of the first scholars who explored the use of different social media platforms used by college students. She found that the four social media platforms (Facebook, MySpace, Xanga and Friendster) differ in their social profiles. Students from educated backgrounds were using Facebook while the opposite was true for MySpace. Further, the percentage of white

and Asian-American Facebook users was significantly higher than that of Hispanic users. In a more recent study, Hargittai (2015) used the 2013 Pew survey data to delve into the digital divide in Facebook, LinkedIn and Twitter. She suggested that age is the dominant demographic predictor, and that all three sites are most used by younger individuals. Recently, Gazit and Aharony (2018) found a negative correlation between age and participation in WhatsApp.

Women tend to update their profile photos, note their status (Wang *et al.*, 2012), write public posts and use social network sites to maintain social relationships more frequently than men (Muscanell and Guadagno, 2012). In addition, women were more likely to use Facebook and men were more likely to use LinkedIn (Hargittai, 2015). Blank and Lutz (2017) investigated social characteristics of users of different social media platforms in Great Britain and maintained that Facebook use was correlated with age and gender, but not with income and education. LinkedIn was related to income, but not with age, gender and education. Twitter was correlated with age and income, but not with gender or education. In a recent study, Thelwall and Vis (2017) explored the issue of gender and image sharing on Facebook, Twitter, Instagram, Snapchat and WhatsApp in the UK. Their findings suggested that women share more photos, and more frequently, on Snapchat, while men share more images on Twitter, particularly for hobbies. Women also tended to have more privacy-related concerns, but were more willing to share pictures of their children. Men were more likely to be alone in their profile pictures.

Other aspects that were investigated concerning the use of different social platforms are: expression of emotions, social capital, users' needs and level of participation. Waterloo *et al.* (2017) explored the norms of expressing emotions on different social media platforms (Facebook, Twitter, Instagram and WhatsApp), and suggested that expressing negative emotions was considered most appropriate for WhatsApp, followed by Facebook, Twitter and Instagram. Regarding expression of positive emotion, WhatsApp was rated as the most appropriate platform, followed by Instagram, Facebook and Twitter. Phua *et al.* (2017) focused on users of four SNSs (Facebook, Twitter, Instagram and Snapchat), and their influence on online bridging and bonding social capital. Results showed that Twitter users had the highest bridging social capital, followed by Instagram, Facebook and Snapchat. Snapchat users had the highest bonding social capital, followed by Facebook, Instagram and Twitter. Karapanos *et al.* (2016) investigated users' needs for choosing Facebook and WhatsApp. They maintained that WhatsApp suggests new opportunities for intimate communication and not serving only as a messaging tool, while Facebook was characterized by non-social uses; a tool that fulfills users' need for information gratification.

Regarding the level participation in different platforms, several researchers (Bronstein *et al.*, 2016) have examined online participation and focused on six different factors that may predict individuals' participation in different platforms: the effect of anonymity, the element of social value orientation (Van Lange *et al.*, 2012), the motivations behind participation in online social platforms, the participation in offline activities, how far the individual believes that the internet enhances his/her political power (The World Internet Project, 2009) and the personal traits of the user. Researchers noted that the participation level in WhatsApp groups was significantly higher than in other types of online groups (e.g. Facebook, forums and talkbacks). Gazit *et al.* (2018) found that participation in online discussions can be determined by personality traits, environmental factors (like familiarity or emotion triggers) and anonymity.

*SNS importance and usage*

The importance variable is often associated with virtual groups and is related to respondents' feelings about the significance they attribute to the group in their daily routine (Aharony and Gazit, 2016; Gazit and Aharony, 2018). Amichai-Hamburger *et al.* (2016) suggested that when individuals felt that there was no match between them and the virtual

discussion, they were unlikely to remain active within it. Rafaeli *et al.* (2004) found that in order to be more active, one should feel comfortable with the virtual environment. Another study suggested that if participants receive a response to their first post, they are likely to participate again (Joyce and Kraut, 2006).

Other factors found to be related to the importance level include the level of group intimacy (Phua, 2014; Rau *et al.*, 2008), the quality of information given in discussions (Lee *et al.*, 2006), the speed and frequency of response and users' perception of the importance of the subjects under discussion (Cheng and Liu, 2012). In a recent study, Gazit and Aharony (2018) noted that the level of WhatsApp group importance played an important role in the participation level. Moreover, it was found that openness and social support were positively correlated with WhatsApp family groups' importance (Aharony and Gazit, 2016). A previous study that examined political online activity before the USA' presidential elections in 2008 revealed a positive relationship between users' perception of Facebook as important and online political activity (Vitak *et al.*, 2011). Gazit *et al.* (2018) interviewed active participants and lurkers through focus groups and found that once the subject of the discussion was relevant to them, both populations were encouraged to take an active part in the discussion. Bronstein *et al.* (2016) found several motivations for participating, including personal and social motivations. Further, Hughes *et al.* (2012) tested the differences between Facebook and Twitter in a manner of social and informational usage. This study assumes that SNSs importance, as well as social and informational usage, may predict the participation frequency on the four SNSs.

*Personality traits and SNS use*

Personality traits are repeatedly found as being correlated with internet use (e.g. Bronstein *et al.*, 2016; Gazit *et al.*, 2018). Hughes *et al.* (2012), who conducted a study that delved into the issue of personality predictors of different SNSs, suggested that a number of personality factors (neuroticism, extraversion, openness, agreeableness, conscientiousness, sociability and need for cognition) were significantly correlated with Facebook and Twitter use. Further, significant differences in personality were observed between those who preferred Facebook and those who preferred Twitter. Those who rated themselves higher in sociability, extraversion and neuroticism preferred Facebook; those who preferred Twitter were higher in need for cognition.

Other scholars (Davenport *et al.*, 2014) explored the role of narcissism in the motives and uses of Facebook and Twitter. They suggested that the features of Twitter make tweeting the favorite means of active usage among narcissists in the college sample, but not among adults who preferred Facebook. A more recent study (Pittman and Reich, 2016) delved into the question of whether image-based platforms (e.g. Instagram, Snapchat) have the potential to alleviate loneliness in contrast to text-based platforms (e.g. Twitter, Yik Yak). Their findings suggested that loneliness may decrease, while happiness and satisfaction with life may increase as a function of image-based social media use, in contrast to text-based media use that seems ineffective.

In the current research, we have focused on three personality traits (openness, extroversion and neuroticism) that have been frequently found related to online behavior.

*Openness and the use of SNS.* Open-minded individuals, rather than being passive recipients of new experiences, are actually in a constant quest for new and unusual encounters, through which they gain a variety of ideas and perspectives (McCrae and Costa, 1997). It has been suggested that individuals who are high in openness have a higher motivation to engage in intellectual activities (Brand, 1994). Several studies have dealt with openness, the internet and SNS use. Correa *et al.* (2010) found that openness is related to internet use, especially in adults. Others (Skues *et al.*, 2012) suggested that people who scored high on openness use Facebook to connect with others so they can discuss a variety

of interesting topics with them. Further, Hollenbaugh and Ferris (2014) noted that individuals who are high on openness, when using Facebook, will post messages on a variety of topics. In a different study, Aharony (2013) found that the more open information professionals are, the greater their Facebook use. In addition, several current studies showed that openness was positively correlated with the importance of WhatsApp family groups (Aharony and Gazit, 2016) and with participation level in online discussions groups (Bronstein *et al.*, 2016). Moreover, active participants in online discussions evaluated themselves as more open to experience than lurkers (Gazit *et al.*, 2018).

*Introversion, extroversion and the use of SNS.* Introverts are quiet people who tend to react rather than initiate, who prefer solitude to socializing, and who do not enjoy large social events. Introverts do not crave excitement and may find themselves regarded as distant and remote. Extroverts are generally considered to be friendly people, who seek the company of others, enjoy excitement, tend to take risks and are more likely to act on impulse (Eysenck and Eysenck, 1975). Hamburger and Ben-Artzi (2000) suggested that introverts may well use online anonymity to recreate themselves, and then express themselves much more as extroverts. This theory is called "the poor get richer."

High extroversion is a predictor of greater use of social networks (Aharony, 2013, 2015; Amichai-Hamburger and Vinitzky, 2010; Bronstein *et al.*, 2016; Gazit and Aharony, 2018; Eftekhar *et al.*, 2014). Furthermore, as extroverts tend to feel positive about themselves, they tend to engage in elaborate online self-presentations in a less restrained manner and tend to post more of their own and group selfie pictures (Baiocco *et al.*, 2016; Qiu *et al.*, 2015). Posting selfies might also function as a display of willingness to seek out virtual social contact (Baiocco *et al.*, 2016). Extroverts also tend to have more friends in social media (Amichai-Hamburger and Vinitzky, 2010; Lönnqvist and Große, 2016). Consequently, introverts frequently consider themselves unpopular (Baiocco *et al.*, 2016). In conclusion, the "rich-get-richer," claiming that extroverts gain more from their internet use than introverts (Kraut *et al.*, 2002), may be applicable to extroverts who tend to gain more from social network usage, as their offline social skills are transferred online (Amichai-Hamburger *et al.*, 2016; Gosling *et al.*, 2011).

*Neuroticism and SNS use.* Neuroticism relates to emotional stability (McCrae and John, 1992) and it has long been thought as related to life stress exposure (Fergusson and Horwood, 1987). The neurotic person is an anxious individual who worries frequently, tends to be overly emotional and reacts too strongly to all types of stimuli (Eysenck and Eysenck, 1975). Neuroticism is characterized by emotional instability (Sadowski and Cogburn, 1997) and it reflects a person's tendency to experience psychological distress. High levels of this trait are associated with a sensitivity to danger (Amichai-Hamburger and Vinitzky, 2010).

Individuals high in neuroticism are more likely to engage in social media (Aharony, 2013; Correa *et al.*, 2010), and prefer online interactions to face-to-face ones (Amichai-Hamburger *et al.*, 2002). Neuroticism is related to a greater tendency to present ideal and false selves on Facebook (Michikyan *et al.*, 2014; Seidman, 2013). Individuals with high levels of neuroticism were found to be more inclined to post their photos on Facebook, than those with low neuroticism (Amichai-Hamburger and Vinitzky, 2010).

The Facebook environment, which is filed with perfect life images (Mehdizadeh, 2010; Nadkarni and Hofmann, 2012), might be even more threatening than the offline social world to highly neurotic people. Consistent with this reasoning, neuroticism was correlated with Facebook social comparison and envy (Chow and Wan, 2017).

### *Locus of control and the use of SNS*

People with an external locus of control believe that life events are the result of external factors like chance or luck. People with an internal locus of control believe in their own

ability to control their life events (Rotter, 1966, 1982). Amichai-Hamburger (2002) suggested that this theory can explain internet addiction. People with an internal locus of control tend to control their time online, as well as carefully controlling the activities in which they choose to participate; those with an external locus of control will tend to be among those surfers with little sense of time who are drawn into different web activities. This was confirmed by Hou *et al.* (2017), who utilized a smartphone networking application to assess the psychological factors associated with excessive use of WeChat. Their results showed that excessive use of WeChat is associated with an external locus of control. Thus, people who believe that events in their lives are caused by external factors tend to overuse WeChat. Such people perceive that they have less control of their environment and hence fail to regulate their WeChat use and behavior. An external locus of control, among individuals who use social networks, was negatively related to subjective well-being, while positively related to loneliness and a preference for social interaction online rather than face to face.

Loneliness and subjective well-being were related (positively and negatively, respectively) to a preference for online social interaction over offline social interaction and they both had a full mediating effect between the relationships of locus of control and preference for online social interaction (Ye and Lin, 2015). These findings showed that students who were lonely, unhappy and externally controlled were more likely to be engaged in excessive online social interaction.

Based on the literature review, the following research hypotheses were developed:

*H1.* There will be gender differences in the participation frequency. Women will participate more than men on SNSs.

*H2.* The younger the students are, the higher their participation frequency on the four SNSs.

*H3.* There will be differences in the participation frequency among the four SNSs; WhatsApp will be the most frequently used social network.

*H4.* The higher the level of importance the students attribute to the four SNSs, the higher their participation frequency on those platforms.

*H5.* The higher the social and informational usage of the SNSs, the higher the participation frequency on those platforms.

*H6.* The more open students are, the higher their participation frequency on the four SNSs.

*H7.* The more extroverted students are, the higher their participation frequency on the four SNSs. The more introverted students are, the lower their participation frequency on the four SNSs.

*H8.* The more neurotic students are, the higher their participation frequency on the four SNSs.

*H9.* The higher students' external locus of control, the higher their participation frequency on the four SNSs. The higher their internal locus of control, the lower their participation frequency on the four SNSs.

## Method

### *Data collection*

The research was conducted in Israel during the Fall semester of the 2017–2018 academic year and encompassed 244 students from two big universities in Israel. Researchers received

permission to enter classes, explained the study's purpose, and that the survey was anonymous. They emphasized to students the importance of the study and that it would take them less than 20 min to complete the questionnaire.

*Data analysis*

Of the 244 who completed the questionnaire, we included only the 221 students whose age was between 20 and 40. We excluded three who marked "never" for using all the SNSs in question. Of the 218, 157 (72 percent) were females and 61 (28 percent) were males. Their average age was 24.67 years (SD = 3.97).

*Measures*

Researchers used six questionnaires: a demographic questionnaire; a participation frequency questionnaire; SNS importance questionnaire; social and informational use questionnaire; the extroversion, openness to experience and neuroticism questionnaire; and the locus of control questionnaire.

The demographic questionnaire contained two questions concerning age and gender.

The participation frequency questionnaire was taken from Bronstein *et al.* (2016). Participants were asked to base their answers on each of the four social network sites: Facebook, WhatsApp, Instagram and Twitter, rating their use from 1 (never) to 6 (a few times a day). After rating how often they read content in the SNSs, three questions addressed the frequency of their active participation: How often they commented, shared (provided content from external sources) or created content in the different SNSs. Cronbach's $\alpha$ of these three items were: Facebook, $\alpha = 0.76$; WhatsApp, $\alpha = 0.78$; Instagram, $\alpha = 0.87$; and Twitter, $\alpha = 0.90$. The average of the three items for each SNS became the four dependent variables ("Participation") in the research.

The importance questionnaire was comprised of six statements rated on a five-point Likert scale (1 = strongest disagreement; 5 = strongest agreement) and was designed to present the extent to which each SNS is important to the participant and the degree to which each SNS was integrated into his/her daily activities. This questionnaire was based on Ellison *et al.*'s (2007) work, in which users were asked about the importance of Facebook, and on Aharony and Gazit's (2016) study, in which users were asked about the importance of the WhatsApp family group. Cronbach's $\alpha$ of these six items were Facebook, $\alpha = 0.88$; WhatsApp, $\alpha = 0.83$; Instagram, $\alpha = 0.92$; Twitter, $\alpha = 0.96$, and the mean of all the items for each SNS was calculated into the independent variable "Importance."

The social and informational usage questionnaire was taken from Hughes *et al.*'s (2012) research, in which the difference between Facebook and Twitter usage was explored. We expanded this questionnaire to explore the four SNSs' social and information use. Participants were asked to base their answers on each of the four social network sites being investigated, rating their agreement from 1 (not at all) to 5 (very much). Three of the statements were about social usage ("I use the SNS to keep in touch with friends"; "I use the SNS because my friends do"; "The SNS is primarily for socializing") and three statements were about informational usage ("I use the SNS to find and spread information"; "The SNS is primarily for information"; "I use the SNS to keep abreast of current events"). Cronbach's $\alpha$ of the items were: informational use, $\alpha = 0.88$ and social use, $\alpha = 0.86$. The means for the informational and social use for each SNS were calculated into the independent variables IU ("Information use") and SU ("Social use").

The extroversion, openness to experience and neuroticism questionnaire was derived from the Big Five questionnaire (McCrae and John, 1992) and consisted of 26 items examining these three personality characteristics rated on a six-point Likert scale (1 = strongest disagreement; 6 = strongest agreement). The values of Cronbach's $\alpha$ were: extroversion, $\alpha = 0.81$; neuroticism, $\alpha = 0.83$; and openness to experience, $\alpha = 0.77$.

The means of all the items for each trait were calculated into the variables "Extroversion," "Neuroticism" and "Openness."

The locus of control scale was derived from Levenson (1981) and consisted of 24 items examining the level of internal and external control, rated on a six-point Likert scale (1 = strongest disagreement; 6 = strongest agreement). The values of Cronbach's $\alpha$ were: internal control, $\alpha = 0.71$ and external control, $\alpha = 0.82$. The mean of the items was calculated into the independent variables "Internal control" and "External control."

## Results

*Difference between SNSs*

In order to examine the differences between the social media sites (WhatsApp, Facebook, Instagram and Twitter) concerning participation, importance, and social and information usage, a repeated ANOVA was conducted for each variable. The differences were all significant and *post hoc* tests (Least Significant Difference test) also showed significant differences between all SNSs. The means, SD, *F*-value and $\eta^2$ are presented in Table I and Figure 1.

Table I and Figure 1 show that WhatsApp received the highest scores for participation, importance, social and information usage, while Twitter had the lowest scores.

*Difference between genders*

In order to examine the difference between males and females, a one-way MANOVA was conducted. Table II presents the means, SD, *F*-value and $\eta^2$.

Table II confirms that there were significant differences between males and females concerning some of the research variables. The main significant differences were in Twitter, in which men were higher than women in all the variables: participation frequency ($F_{(1, 216)} = 21.55$, $p < 0.001$; $\eta^2 = 0.09$), importance ($F_{(1, 216)} = 24.76$, $p < 0.001$; $\eta^2 = 0.10$), social usage ($F_{(1, 216)} = 8.63$, $p < 0.01$; $\eta^2 = 0.04$) and informational usage ($F_{(1, 216)} = 16.78$, $p < 0.001$; $\eta^2 = 0.07$).

However, for WhatsApp and Instagram, women scored higher than men in some variables. There were significant differences in the following: WhatsApp participation frequency ($F_{(1, 216)} = 3.92$, $p < 0.05$; $\eta^2 = 0.02$) and importance ($F_{(1, 216)} = 3.66$, $p < 0.05$;

**Table I.**
Differences between social media sites (WhatsApp, Facebook, Instagram and Twitter) in participation, importance, and social and information use

| Variable | SNS | Mean | SD | *F* | $\eta^2$ |
|---|---|---|---|---|---|
| Participation | WhatsApp | 4.64 | 1.05 | 529.63** | 0.88 |
| | Facebook | 3.37 | 1.07 | | |
| | Instagram | 3.14 | 1.49 | | |
| | Twitter | 1.26 | 0.80 | | |
| Importance | WhatsApp | 4.40 | 0.68 | 832.64** | 0.92 |
| | Facebook | 3.65 | 0.99 | | |
| | Instagram | 3.24 | 1.49 | | |
| | Twitter | 1.27 | 0.75 | | |
| Social use | WhatsApp | 4.14 | 0.82 | 708.69** | 0.91 |
| | Facebook | 3.11 | 1.13 | | |
| | Instagram | 2.64 | 1.35 | | |
| | Twitter | 1.15 | 0.51 | | |
| Information use | WhatsApp | 3.87 | 0.90 | 352.27** | 0.83 |
| | Facebook | 3.54 | 1.07 | | |
| | Instagram | 2.78 | 1.35 | | |
| | Twitter | 1.37 | 0.93 | | |

**Note:** $^{**}p < 0.001$

$\eta^2 = 0.02$); Instagram participation frequency ($F_{(1, 216)} = 2.99$, $p < 0.05$; $\eta^2 = 0.01$) and informational use ($F_{(1, 216)} = 4.73$, $p < 0.05$; $\eta^2 = 0.02$).

In addition, there was a significant difference in neuroticism ($F_{(1, 216)} = 6.37$, $p < 0.01$; $\eta^2 = 0.03$). Women were more neurotic than men. There were no differences in the Facebook variables, as well as in the other psychological traits.

*Correlations between participation frequency and the other variables*

In order to examine the relationships between the dependent variable participation with importance, social and informational usage, age, extroversion, openness, neuroticism, and internal and external control in WhatsApp, Facebook, Instagram and Twitter, researchers performed four Pearson correlations, presented in Table III.

Table III presents strong positive significant correlations between participation and importance for all SNSs ($r = 0.56$–$0.92$, $p < 0.001$). Hence, the higher the level of SNS importance, the higher the participation frequency. There were also positive moderate significant correlations between participation frequency and social and informational usage in Facebook ($r = 0.41$–$0.52$, $p < 0.001$) and strong correlations between participation frequency and social and informational usage in Instagram and Twitter ($r = 0.63$–$0.78$, $p < 0.001$). Thus, the higher the social and informational use, the higher the participation frequency. In addition, there were significant strong correlations between importance and social and informational use in Facebook, Instagram and Twitter ($r = 0.58$–$0.82$, $p < 0.001$).

Regarding demographic and psychological traits, Table III shows low negative correlations between age and participation frequency in Facebook and WhatsApp ($r = -0.16$–$0.20$, $p < 0.01$) and a strong negative correlation between age and participation frequency in Instagram ($r = -0.50$, $p < 0.001$). Thus, the older the students, the lower their participation frequency. There was no correlation between age and participation frequency in Twitter.

There were also low to medium correlations between participation frequency and extroversion in Facebook and WhatsApp ($r = 0.21$–$0.24$, $p < 0.01$) and a stronger correlation in Instagram ($r = 0.40$, $p < 0.001$). Hence, the more that students are extroverted, the higher their participation frequency. There was no correlation between extroversion and participation frequency in Twitter.

Finally, there were some low but unique correlations for each SNS: there was a positive significant correlation between openness and participation frequency in Facebook

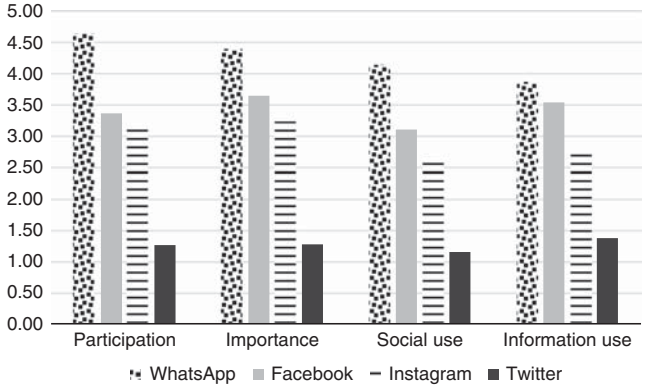


**Figure 1.**
Differences between the social media sites (WhatsApp, Facebook, Instagram and Twitter) in participation, importance, social and information usage

| SNS | Women ($N = 157$) $M$ | SD | Men ($N = 61$) $M$ | SD | $F$ | $\eta^2$ |
|---|---|---|---|---|---|---|
| *WhatsApp* | | | | | | |
| Participation | 4.72 | 1.05 | 4.41 | 1.02 | 3.92* | 0.02 |
| Importance | 4.45 | 0.66 | 4.25 | 0.70 | 3.66* | 0.02 |
| Social use | 4.17 | 0.81 | 4.09 | 0.86 | 0.33 | 0.00 |
| Information use | 3.90 | 0.94 | 3.81 | 0.84 | 0.38 | 0.00 |
| *Facebook* | | | | | | |
| Participation | 3.38 | 1.05 | 3.40 | 1.12 | 0.03 | 0.00 |
| Importance | 3.70 | 0.96 | 3.49 | 1.07 | 1.82 | 0.01 |
| Social use | 3.11 | 1.10 | 3.08 | 1.21 | 0.04 | 0.00 |
| Information use | 3.57 | 1.05 | 3.49 | 1.15 | 0.23 | 0.00 |
| *Instagram* | | | | | | |
| Participation | 3.26 | 1.52 | 2.87 | 1.35 | 2.99* | 0.01 |
| Importance | 3.35 | 1.49 | 3.02 | 1.45 | 2.14 | 0.01 |
| Social use | 2.67 | 1.32 | 2.62 | 1.45 | 0.07 | 0.00 |
| Information use | 2.91 | 1.35 | 2.47 | 1.30 | 4.73* | 0.02 |
| *Twitter* | | | | | | |
| Participation | 1.11 | 0.40 | 1.64 | 1.30 | 21.55*** | 0.09 |
| Importance | 1.12 | 0.41 | 1.65 | 1.17 | 24.76*** | 0.10 |
| Social use | 1.09 | 0.35 | 1.31 | 0.77 | 8.63** | 0.04 |
| Information use | 1.22 | 0.71 | 1.77 | 1.25 | 16.78*** | 0.07 |
| *BIG5* | | | | | | |
| Extroversion | 4.07 | 1.01 | 4.09 | 0.79 | 0.02 | 0.00 |
| Neuroticism | 3.54 | 0.95 | 3.18 | 0.98 | 6.37** | 0.03 |
| Openness | 4.22 | 0.81 | 4.35 | 0.77 | 1.24 | 0.01 |
| *Locus of control* | | | | | | |
| InControl | 4.15 | 0.75 | 4.22 | 0.67 | 0.47 | 0.00 |
| ExControl | 2.54 | 0.61 | 2.59 | 0.68 | 0.20 | 0.00 |

**Notes:** $N = 218$. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

**Table II.**
Differences in the research variables between males and females

($r = 0.18$, $p < 0.01$). There were positive significant correlations between informational usage and neuroticism ($r = 0.20$, $p < 0.01$) and between informational usage and external control ($r = 0.18$, $p < 0.01$) in Instagram. Also, positive significant correlations were found between informational and social usage and external control ($r = 0.14$, $p < 0.05$) in Twitter. Further, there was a positive significant correlation between internal control and participation frequency in WhatsApp ($r = 0.24$, $p < 0.001$).

*Predicting participation frequency in the SNSs*

In order to explain the participation frequency on the different SNSs, four hierarchical regression analyses were conducted. The regressions explained 35 percent of the variance in the participation frequency of WhatsApp usage, 45 percent of Facebook usage, 78 percent of Instagram usage and 85 percent of Twitter usage. The predictors were entered as five steps: demographic variables: age and gender; psychological factors: extroversion, neuroticism and openness; locus of control: external and internal; social usage and informational usage; and the importance of the SNS. We did not find any interactions. Table IV presents the standardized and unstandardized coefficients of the hierarchical regressions of the participation frequency in each of the SNSs: WhatsApp, Facebook, Instagram and Twitter.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| *WhatsApp* | | | | | | | | | |
| Participation | 0.56*** | 0.37*** | 0.45*** | −0.20** | 0.21** | 0.04 | 0.11 | 0.24*** | 0.06 |
| 1 Importance | | 0.40*** | 0.55*** | −0.30*** | 0.24** | 0.03 | −0.01 | 0.13 | 0.07 |
| 2 Social use | | | 0.33** | 0.00 | 0.10 | −0.04 | −0.03 | 0.08 | −0.01 |
| 3 Information use | | | | −0.07 | 0.14* | 0.03 | 0.04 | 0.12 | 0.08 |
| *Facebook* | | | | | | | | | |
| Participation | 0.63*** | 0.41*** | 0.52*** | −0.16** | 0.24*** | 0.04 | 0.18** | 0.07 | 0.02 |
| 1 Importance | | 0.58*** | 0.68*** | −0.26*** | 0.29*** | 0.05 | −0.02 | 0.087 | 0.11 |
| 2 Social use | | | 0.48*** | −0.10 | 0.19** | 0.02 | 0.03 | 0.01 | 0.15* |
| 3 Information use | | | | −0.13 | 0.16* | 0.08 | 0.04 | 0.06 | 0.15* |
| *Instagram* | | | | | | | | | |
| Participation | 0.86*** | 0.78*** | 0.72*** | −0.50*** | 0.40*** | 0.09 | 0.11 | 0.09 | 0.05 |
| 1 Importance | | 0.80*** | 0.82*** | −0.47*** | 0.34*** | 0.10 | 0.02 | 0.03 | 0.09 |
| 2 Social use | | | 0.70*** | −0.47*** | 0.31*** | 0.08 | 0.01 | 0.03 | 0.12 |
| 3 Information use | | | | −0.43*** | 0.24*** | 0.20** | 0.01 | −0.05 | 0.18** |
| *Twitter* | | | | | | | | | |
| Participation | 0.92*** | 0.63*** | 0.75*** | 0.09 | −0.13 | −0.08 | 0.06 | 0.04 | 0.07 |
| 1 Importance | | 0.58*** | 0.80*** | 0.10 | −0.16* | −0.08 | 0.06 | −0.01 | 0.12 |
| 2 Social use | | | 0.56*** | −0.02 | −0.13 | −0.03 | 0.07 | 0.02 | 0.14* |
| 3 Information use | | | | 0.15* | −0.13* | −0.06 | 0.07 | 0.02 | 0.14* |
| 4 Age | | | | | −0.24*** | −0.01 | −0.01 | 0.02 | −0.06 |
| *BIG5* | | | | | | | | | |
| 5 Extroversion | | | | | | −0.16* | 0.24*** | 0.24*** | −0.20** |
| 6 Neuroticism | | | | | | | −0.02 | −0.25*** | 0.28*** |
| 7 Openness | | | | | | | | 0.32*** | 0.00 |
| *Locus of control* | | | | | | | | | |
| 8 InControl | | | | | | | | | −0.10 |
| 9 ExControl | | | | | | | | | |

**Notes:** *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

**Table III.** Pearson correlations between participation and: importance (1), social usage (2), informational usage (3), age (4), extroversion (5), neuroticism (6), openness (7), internal control (8) and external control (9) for WhatsApp, Facebook, Instagram and Twitter

*WhatsApp regression*

The first step introduced age and gender variables. The age variable contributed significantly by adding 5 percent to the explained variance of the participation frequency. The $\beta$ coefficient of the age variable was negative and significant ($\beta = -0.19$, $p < 0.01$). Hence, the higher the age, the lower users' WhatsApp participation frequency.

The second step introduced the psychological traits extroversion, neuroticism and openness. Extroversion contributed significantly by adding 4 percent to the explained variance of WhatsApp participation frequency. The $\beta$ coefficient of this variable was positive and significant ($\beta = 0.13$, $p < 0.05$). Thus, the higher participants' level of extroversion, the higher their WhatsApp participation frequency.

The third step introduced the locus of control variable as external and internal control. Internal control contributed significantly by adding 5 percent to the explained variance of WhatsApp participation frequency. The $\beta$ coefficient of the internal control was significant and positive ($\beta = 0.24$, $p < 0.01$). Therefore, the higher participants' level of internal control, the higher their WhatsApp participation frequency.

The fourth step introduced social and informational usage that contributed significantly by adding 19 percent to the explained variance of WhatsApp participation frequency. The $\beta$ coefficient of social usage was significant and positive ($\beta = 0.29$, $p < 0.001$) and the $\beta$ coefficient of informational usage was significant and positive ($\beta = 0.27$, $p < 0.001$).

| | Predictors | WhatsApp $B$ | WhatsApp $\beta$ | WhatsApp $\Delta R^2$ | WhatsApp $R^2$ | Facebook $B$ | Facebook $\beta$ | Facebook $\Delta R^2$ | Facebook $R^2$ |
|---|---|---|---|---|---|---|---|---|---|
| 1 | Age | −0.05 | −0.19** | 0.05** | 0.05** | −0.05 | −0.20** | 0.04** | 0.04** |
| | Gender | 0.21 | 0.09 | | | −0.14 | −0.06 | | |
| 2 | Extroversion | 0.14 | 0.13* | 0.04* | 0.09* | 0.21 | 0.18** | 0.07** | 0.11** |
| | Neuroticism | 0.03 | 0.03 | | | 0.09 | 0.08 | | |
| | Openness | 0.15 | 0.11 | | | 0.18 | 0.14* | | |
| 3 | InControl | 0.34 | 0.24** | 0.05** | 0.14** | 0.03 | 0.02 | 0.00 | 0.11 |
| | ExControl | 0.12 | 0.07 | | | 0.10 | 0.06 | | |
| 4 | Social use | 0.34 | 0.29*** | 0.19*** | 0.33*** | 0.18 | 0.19** | 0.25*** | 0.36*** |
| | Information use | 0.34 | 0.27*** | | | 0.40 | 0.40*** | | |
| 5 | Importance | 0.80 | 0.50*** | 0.07*** | 0.40*** | 0.53 | 0.49*** | 0.09*** | 0.45*** |
| | Predictors | Instagram $B$ | Instagram $\beta$ | Instagram $\Delta R^2$ | Instagram $R^2$ | Twitter $B$ | Twitter $\beta$ | Twitter $\Delta R^2$ | Twitter $R^2$ |
| 1 | Age | −0.19 | −0.50*** | 0.25*** | 0.25*** | 0.00 | 0.02 | 0.08*** | 0.08*** |
| | Gender | 0.02 | 0.01 | | | −0.50 | −0.28*** | | |
| 2 | Extroversion | 0.46 | 0.29*** | 0.10*** | 0.35*** | −0.15 | −0.18** | 0.03** | 0.11** |
| | Neuroticism | 0.18 | 0.12* | | | −0.05 | −0.06 | | |
| | Openness | 0.12 | 0.06 | | | 0.10 | 0.10 | | |
| 3 | InControl | 0.07 | 0.03 | 0.00 | 0.35 | 0.05 | 0.05 | 0.00 | 0.11 |
| | ExControl | 0.13 | 0.06 | | | 0.04 | 0.03 | | |
| 4 | Social use | 0.52 | 0.47*** | 0.36*** | 0.71*** | 0.45 | 0.28*** | 0.50*** | 0.61*** |
| | Information use | 0.35 | 0.32*** | | | 0.48 | 0.56*** | | |
| 5 | Importance | 0.61 | 0.60*** | 0.08*** | 0.78*** | 0.90 | 0.84*** | 0.24*** | 0.85*** |

**Notes:** $n = 218$. *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$

**Table IV.**
Hierarchical regression coefficients of the explained variance of the participation frequency

Hence, the higher participants' social and informational use, the higher their WhatsApp participation frequency.

The fifth step introduced the importance of WhatsApp variable that contributed significantly by adding 21 percent to the explained variance of WhatsApp participation level. The $\beta$ coefficient of the WhatsApp importance was significant and positive ($\beta = 0.50$, $p < 0.001$). Hence, the higher participants' level of WhatsApp importance was, the higher their WhatsApp participation frequency.

*Facebook regression*

The first step introduced age and gender variables. The age variable contributed significantly by adding 4 percent to the explained variance of the Facebook participation frequency. The $\beta$ coefficient of the age variable was negative and significant ($\beta = -0.20$, $p < 0.01$). Hence, the higher participants' age, the lower their Facebook participation frequency.

The second step introduced the psychological traits of extroversion, neuroticism and openness. Extroversion and openness contributed significantly by adding 7 percent to the explained variance of Facebook participation frequency. The $\beta$ coefficient of extroversion was positive and significant ($\beta = 0.18$, $p < 0.01$) and the $\beta$ coefficient of openness was positive and significant ($\beta = 0.14$, $p < 0.05$). Thus, the higher the level of participants' extroversion and openness, the higher their Facebook participation frequency.

The third step introduced the locus of control variables (external and internal control) that did not contribute significantly to the explained variance of the Facebook participation frequency.

The fourth step introduced the social and informational usage that contributed significantly by adding 25 percent to the explained variance of Facebook participation frequency. The $\beta$ coefficient of the social usage was significant and positive ($\beta = 0.19$, $p < 0.01$) and the $\beta$ coefficient of the informational usage was significant and positive

($\beta = 0.40$, $p < 0.001$). Hence, the higher participants' social and informational use, the higher their Facebook participation frequency.

The fifth step introduced the importance of Facebook variable; it contributed significantly by adding 9 percent to the explained variance of Facebook participation frequency. The $\beta$ coefficient of the Facebook importance was significant and positive ($\beta = 0.49$, $p < 0.001$). Hence, the higher participants' level of Facebook importance was, the higher their Facebook participation frequency.

*Instagram regression*

The first step introduced age and gender variables. Age contributed significantly by adding 25 percent to the explained variance of Instagram participation frequency. The $\beta$ coefficient of the age variable was negative and significant ($\beta = -0.50$, $p < 0.001$). Hence, the higher participants' age, the lower their Instagram participation frequency.

The second step introduced psychological traits (extroversion, neuroticism and openness) as variables. Extroversion and neuroticism contributed significantly by adding 10 percent to the explained variance of Instagram participation frequency. The $\beta$ coefficient of extroversion was positive and significant ($\beta = 0.29$, $p < 0.001$) and the $\beta$ coefficient of neuroticism was positive and significant as well ($\beta = 0.12$, $p < 0.05$). Thus, the higher the participants' levels of extroversion and neuroticism, the higher their Instagram participation frequency.

The third step introduced the locus of control variables (external and internal control) that did not contribute significantly to the explained variance of the Instagram participation frequency.

The fourth step introduced social and informational usage variables that contributed significantly by adding 36 percent to the explained variance of Instagram participation frequency. The $\beta$ coefficient of social usage was significant and positive ($\beta = 0.47$, $p < 0.001$) and the $\beta$ coefficient of informational usage was also significant and positive ($\beta = 0.32$, $p < 0.001$). Hence, the higher participants' social and informational use, the higher their Instagram participation frequency.

The fifth step introduced the importance of Instagram variable that contributed significantly by adding 8 percent to the explained variance of Instagram participation frequency. The $\beta$ coefficient of the Instagram importance was significant and positive ($\beta = 0.60$, $p < 0.001$). Hence, the higher participants' level of Instagram importance was, the higher their Instagram participation frequency.

*Twitter regression*

The first step introduced age and gender variables. The gender variable contributed significantly by adding 8 percent to the explained variance of the Twitter participation frequency. The $\beta$ coefficient of the gender variable was negative and significant ($\beta = -0.28$, $p < 0.001$). Hence, men participate more often than women.

The second step introduced the psychological traits of extroversion, neuroticism and openness. Extroversion contributed significantly by adding 3 percent to the explained variance of Twitter participation frequency. The $\beta$ coefficient of extroversion was negative and significant ($\beta = -0.18$, $p < 0.01$). Thus, the higher the level of participants' extroversion, the lower their Twitter participation frequency.

The third step introduced the locus of control variable of external and internal control that did not contribute significantly to the explained variance of the Twitter participation frequency.

The fourth step introduced the social and informational usage that contributed significantly by adding 50 percent to the explained variance of Twitter participation frequency. The $\beta$ coefficient of the social usage was significant, moderate and positive ($\beta = 0.28$, $p < 0.001$) and the $\beta$ coefficient of the informational usage was significant, strong

and positive ($\beta = 0.56$, $p < 0.001$). Hence, the higher participants' social and especially informational use, the higher their Twitter participation frequency.

The fifth step introduced the importance of Twitter variable that contributed significantly by adding 24 percent to the explained variance of Twitter participation frequency. The $\beta$ coefficient of Twitter importance was significant, positive and very strong ($\beta = 0.84$, $p < 0.001$). Hence, the higher participants' level of Twitter importance, the higher their Twitter participation frequency is.

For all four regression analyses, including the fifth step caused a decrease in the $\beta$ size of the social and informational usage variables. A Sobel test indicated that SNS importance mediated between the social and informational usage and participation frequency. Social usage for WhatsApp was $z = 2.64$ ($p < 0.01$), Facebook $z = 2.80$ ($p < 0.01$), Instagram $z = 4.23$ ($p < 0.001$), and for Twitter $z = 3.84$ ($p < 0.001$). Informational usage for WhatsApp ($z = 2.89$, $p < 0.01$), Facebook ($z = 3.33$, $p < 0.01$), Instagram ($z = 4.88$, $p < 0.001$) and for Twitter ($z = 5.24$, $p < 0.001$). Hence, the higher social and informational usage is, the higher the importance of the SNS, which predicts more frequent participation.

## Discussion

This study considered the participation frequency of the four biggest SNSs in Israel (Facebook, WhatsApp, Instagram and Twitter) and explored how demographic variables (age and gender), SNS importance, social and informational usage, and personality traits (extroversion/introversion, openness, neuroticism, internal and external locus of control) can explain participation frequency on these platforms. The fact that we got a comprehensive view of SNS's usage for each student turns this research into a significant one in understanding the role of various SNSs in young adults' lives.

First, we found demographic differences concerning the participation frequency among the four SNSs. There were differences between genders in SNS usage. The main significant differences were on Twitter: men's scores were higher than women's across all variables (participation frequency, importance, social and informational usage). WhatsApp and Instagram findings reveal that women participated more frequently than men, but there were no gender differences in Facebook. Hence, our first hypothesis (*H1*) that assumed that women would participate more frequently than men was accepted for two SNSs (WhatsApp and Instagram) and was rejected for Twitter and Facebook. Thelwall and Vis (2017) found that men share more images on Twitter while women tended to have more privacy-related concerns, but were more willing to show their children's photos. The latter is reflected in our results: women using WhatsApp and Instagram got higher scores than men in participation frequency. There were no differences between genders in Facebook usage, which challenges Hargittai's (2015) findings who suggested that women were more likely than men to use Facebook.

*H2*, focusing on age, was accepted for WhatsApp, Facebook and Instagram, but rejected for Twitter. For WhatsApp and Facebook, there were low to moderate negative correlations between age and usage, while Instagram showed strong negative correlations between age and usage, so that the younger the participants, the more they used Instagram. This finding reinforces Gazit and Aharony's (2018) research, who found a negative correlation between age and participation level in WhatsApp groups, but contradicts Blank and Lutz's (2017) research who did not find any correlation between age and Instagram usage. The fact that 71 percent of young Americans (age 18–24) use Instagram (Smith and Anderson, 2018) may support our findings that Instagram is a more powerful tool for younger people. In addition, we found no significant correlations between age and usage in Twitter. Hargittai (2015) claimed that Facebook and Twitter are most used by younger individuals. The current research results echo her findings only for Facebook. Twitter, as the least used SNS in this research sample, is different in that there was no correlation with age.

Results pertaining to *H3* were also accepted, indicating that there was a significant difference among the SNSs concerning usage variables, and especially in participation frequency. WhatsApp is significantly more frequently used than Facebook, followed by Instagram. Twitter is the least used. WhatsApp is already known as the most popular social network in Israel (Israeli Internet Report, 2018) and Bronstein *et al.* (2016) pointed out the popularity of WhatsApp as a preferred platform for online group discussions. WhatsApp is a private platform that is mainly used to interact with close friends and family, opening up the possibility for intimate conversations (Karapanos *et al.*, 2016). This may explain its higher participation frequency compared to Facebook, Instagram and Twitter (which are more public) (Amichai-Hamburger and Hayat, 2017; Waterloo *et al.*, 2017).

*H4* and *H5*, concerning SNSs importance and the social and informational usage, were also accepted: findings showed strong relationships between participation frequency, SNSs importance, social and informational usage, with importance being a mediator between social and informational usage and participation frequency. Hence, the higher the social and informational usage is, the more importance participants attribute to the SNSs, which also predicts their participation frequency. The strong relationship found between importance and participation frequency echoes previous research that explored participation level in WhatsApp groups (Gazit and Aharony, 2018). The current research also found this was true for Facebook, Instagram and Twitter. In addition, this is the first time, as far as we know, that social and informational usage is being correlated with importance and participation frequency – making these three factors an important base for understanding participation in social network sites.

Finally, the regression analysis allowed us to understand aspects that were common and unique to each SNS. For example, considering psychological variables, Facebook was the only SNS for which openness predicted participation, thus accepting *H*6 for Facebook only and rejecting it for the other platforms. The positive relationship between openness and online participation was already mentioned in previous studies (e.g. Bronstein *et al.*, 2016; Gazit *et al.*, 2018) and was found mainly on Facebook (Aharony, 2013; Hollenbaugh and Ferris, 2014; Skues *et al.*, 2012). Facebook can be considered a semi-public setting where individuals keep in touch with old friends and make new ones (Amichai-Hamburger and Hayat, 2017), but users are generally unfamiliar with a great percentage of their Facebook audience (Chou and Edge, 2012). Thus, one should perhaps have an open personality in order to post and comment more often. The lack of relationship in other SNSs is partly supported by Gazit and Aharony's (2018) research that also did not find a relationship between openness and participation level in WhatsApp groups.

*H7* was accepted, revealing that an extroverted personality predicted higher participation frequency. It was previously shown that more extroverted people tend to participate more actively in online discussions (Aharony, 2015; Bronstein *et al.*, 2016; Gazit *et al.*, 2018). In addition, the relationship between extroversion and participation frequency in Instagram was striking, maybe because participation in this SNS uses mainly visual materials (Waterloo *et al.*, 2017), a characteristic with which extroverted people probably feel comfortable (Baiocco *et al.*, 2016).

Results pertaining to *H8* were partially accepted. Instagram was the only social network site in which neuroticism predicted participation. The lack of relationship between neuroticism and participation in the other SNSs is supported by previous studies that also failed to find this relationship in WhatsApp (Gazit and Aharony, 2018) or in online discussion groups such as WhatsApp, Facebook or forums (Bronstein *et al.*, 2016). Almost a decade ago, individuals with high levels of neuroticism were found to be more inclined to post their photos on Facebook (Amichai-Hamburger and Vinitzky, 2010). These days, one might think that it is easier and more suitable to post photos on Instagram rather than on other SNSs; this might be the new environment in which neurotic people feel more comfortable.

Finally, concerning the internal and external locus of control, *H9* was rejected for all SNSs; there were no correlations between external locus of control and participation frequency. However, a positive correlation was found between internal locus of control and participation frequency in WhatsApp. This contradicts Hou *et al.*'s (2017) research, which found that excessive use of WeChat – the parallel application of WhatsApp in China – was associated with an external locus of control. Thus, people who believe that events in their lives are caused by external factors tend to overuse WeChat. In this research, it seems that users who are higher in their internal locus of control feel more comfortable with participating in a non-threatening environment like WhatsApp. This finding may be associated with Gazit *et al.* (2018), who suggested that there is a correlation between a sense of control and participation in online discussion groups.

## Conclusions and limitations

This study presents interesting findings that give a more comprehensive picture of the different usages of the main SNSs in Israel (WhatsApp, Facebook, Instagram and Twitter). The findings reveal that different social network sites play distinct roles for various individuals. This study does not examine a single social media outlet, but rather examines four, thus demonstrating how they serve different goals for different people. WhatsApp, the most frequently used platform, is used more by women and people who have an internal locus of control. Facebook is more frequently used by open people, and Instagram is more frequently used by women, younger adults and neurotic people. Twitter is more frequently used by men, with age not being a factor. In addition, for all SNSs, the higher the social and informational usage is, the more important the SNSs are to the users, which significantly predicts participation frequency.

These differences between social networks can be evidence that each social network serves a different group and does not compete with other SNSs. Thus, if individuals or organizations would like to convey a certain message, they should recognize what is the most appropriate social media channel through which they can reach their potential audience.

Further, the research findings may well explain why many people make use of several social networks and have a tendency to move from one to another. This understanding can also help to explain why it made sense for Facebook to acquire both Instagram and WhatsApp. As each social network serves a different purpose, it makes sense to acquire and maintain them all, thus achieving an ever-growing power in this arena.

The current study has several limitations. As the study included only Israeli students, we suggest that in order to gain an international perspective, it should be conducted in other countries as well. In addition, as the data collection was limited to students, future research should try and replicate it among the general population. Further, a future study may include a qualitative method in order to achieve deeper understanding of the variety of SNS use.

To conclude, our research has given an insightful picture of the different social networks and demonstrated both their power and the reasons for their existence. It is hoped that it will extend our understanding of a major part of many people's lives.

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**Appendix. SNS questionnaire**

(1) Personal details:

- Age
- Gender

(2) Participation frequency.

What is the frequency of your activities in each of the four social network sites: Facebook, WhatsApp, Instagram and Twitter from 1 (never) to 6 (a few times a day):

- I read content posted by others in discussions conducted in internet groups/ platforms.
- I respond to content posted by others.
- I share with the group content from other sources.
- I create new content (text, images, videos, etc.).

(3) The importance questionnaire.

The following are statements describing your use and reference to the four social network sites: Facebook, WhatsApp, Instagram and Twitter. Please select your agreement with the following statements for each network, where 1 indicates complete disagreement, and 5 indicates strongest agreement:

- The SNS is part of my everyday activity.
- I am proud to tell people I'm on the SNS.
- The SNS has become part of my daily routine.
- I feel out of touch when I haven't logged onto the SNS for a while.
- I feel I am part of the SNS community.
- I would be sorry if the SNS shuts down.

(4) The social and informational usage questionnaire.

The following are statements describing your use and reference to the four social network sites: Facebook, WhatsApp, Instagram and Twitter. Please select your agreement with the following statements for each network, where 1 indicates complete disagreement, and 5 indicates strongest agreement.

Social usage:

- I use the SNS to keep in touch with friends.
- I use the SNS because my friends do.
- The SNS is primarily for socializing.

Information usage:

- I use the SNS to find and spread information.
- The SNS is primarily for information.
- I use the SNS to keep abreast of current events.

(5) Extroversion, openness and neuroticism.

Here are a number of characteristics that may or may not apply to you. Please mark the number next to each statement to indicate the extent to which you agree or disagree with that statement (1 = strongest disagreement; 6 = strongest agreement):

- Is talkative.
- Is depressed, blue.

- Is original, comes up with new ideas.
- Is reserved.
- Is relaxed, handles stress well.
- Is curious about many different things.
- Is full of energy.
- Can be tense.
- Is ingenious, a deep thinker.
- Generates a lot of enthusiasm.
- Worries a lot.
- Has an active imagination.
- Tends to be quiet.
- Is emotionally stable, not easily upset.
- Is inventive.
- Has an assertive personality.
- Can be moody.
- Values artistic, aesthetic experiences.
- Is sometimes shy, inhibited.
- Remains calm in tense situations.
- Prefers work that is routine.
- Is outgoing, sociable.
- Gets nervous easily.
- Likes to reflect, play with ideas.
- Has few artistic interests.
- Is sophisticated in art, music, or literature.

(6) The locus of control scale.

For each of the following statements, indicate the extent to which you agree or disagree by marking the appropriate number from 1 = strongest disagreement to 6 = strongest agreement:

- Whether or not I get to be a leader depends mostly on my ability.
- To a great extent my life is controlled by accidental happenings.
- I feel like what happens in my life is mostly determined by powerful people.
- Whether or not I get into a car accident depends mostly on how good a driver I am.
- When I make plans, I am almost certain to make them work.
- Often there is no chance of protecting my personal interests from bad luck.
- When I get what I want, it's usually because I'm lucky.
- Although I might have good ability, I will not be given leadership responsibility without appealing to those in positions of power.
- How many friends I have depends on how nice a person I am.

- I have often found that what is going to happen will happen.
- My life is chiefly controlled by powerful others.
- Whether or not I get into a car accident is mostly a matter of luck.
- People like myself have very little chance of protecting our personal interests when they conflict with those of strong pressure groups.
- It's not always wise for me to plan too far ahead because many things turn out to be a matter of good or bad fortune.
- Getting what I want requires pleasing those people above me.
- Whether or not I get to be a leader depends on whether I'm lucky enough to be in the right place at the right time.
- If important people were to decide they didn't like me, I probably wouldn't make many friends.
- I can pretty much determine what will happen in my life.
- I am usually able to protect my personal interests.
- Whether or not I get into a car accident depends mostly on the other driver.
- When I get what I want, it's usually because I worked hard for it.
- In order to have my plans work, I make sure that they fit in with the desires of people who have power over me.
- My life is determined by my own actions.
- It's chiefly a matter of fate whether or not I have a few friends or many friends.

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