Social Media and Loneliness - Forever connected?

Roman Yavich[2], Nitza Davidovitch[1] & Zeev Frenkel[2]

[1]School of Education, Ariel University, Ariel, Israel

[2]Department of Mathematics, Ariel University, Ariel, Israel

Correspondence: Nitza Davidovitch, School of Education, Ariel University, 40700 Ariel, Israel. Tel: 972-3906-6103. E-mail: d.nitza@ariel.ac.il

Abstract

Young adults' use of social media has soared in recent years, and the many hours that young adults now spend in front of screens replace time spent in face-to-face interactions. Previous studies indicate that the unique features of social media offer advantages to adolescents compared with other communications media. Today, the fact that young adults spend a significant part of their social lives spent on social media and forums triggers an important question that interests educators and therapists about whether presence in the digital world offers an adequate sense of social belonging and mitigates the feeling of loneliness that young adults occasionally experience. Using self-report questionnaires, this study examined associations between reported Facebook usage patterns and loneliness among Ariel University students. The hypotheses of this study, predicting an association between social media usage and loneliness, were not supported, in contrast to findings of previous studies.

Keywords: social media, facebook, loneliness

1. Introduction

In the past decade, social media have become an integral part of the lives of children, adolescents, and adults. Almost everyone uses this medium to connect to friends, family, co-workers, and communities, and a significant part of young people's social lives is now being conducted on social media and online forums (Nielsen Wire, 2010; Smith & Anderson, 2018). The unique features of online social media offer benefits to many youngsters and young adults compared with other communications media: their public nature, immediacy, and accessibility contribute to users' social development and knowledge (Wells & Mitchell, 2008). One of the important questions raised by educators and therapists is whether young people's presence in the virtual sphere constitutes an adequate substitute for a sense of belonging and mitigates the loneliness that young adults often experience (B ányai et al., 2017; Dzogang et al., 2017; O'Keeffe & Clarke-Pearson, 2011; Przybylski et al., 2013; Turkle, 2012).

In this study we examine the association between social media use and loneliness. We specifically seek to explore the findings that more intensive use of social media is associated with higher levels of loneliness (e.g., Sheldon, 2008; Primack et al., 2017; Hunt et al., 2018). We also examine how this association is related to personal status, gender, and age.

1.1 Social Networks

Numerous researchers have offered definitions of social networks. Riegner (2007) defined a social network as a type of virtual community whose basic goal is to create interactions using online tools between people who share common social, romantic, business, or other interests. Boyd and Ellison (2007) define social media websites as an online medium that makes it possible for individuals to create an online profile, and share it with friends or with the general public. Using social networks, people disseminate their personal profiles and share contents related to their private or business lives. Furthermore, many social network platforms allow users to upload images and access other people's' profiles, and provides numerous opportunities to create friendships and interactions.

A study by Statista (2018a) found that ~80% of US internet users are connected to online social networks. In 2018, more than 1.6 billion people worldwide maintain one or more active social media account(s) on social media, representing a total of approximately 2.7 billion "monthly active" accounts (Statista, 2018b). Israel has

one of the highest Internet and social media use rates in the world (Poushter, Bishop, & Chwe, 2018). According to this research, most of Israel's adults use the Internet (88%) and social media (68%), compared to worldwide medians are 75% and 53%, respectively. However, such results are inconsistent with the total number of active social media accounts in Israel (Statista, 2018b), suggesting that the estimation that only 58% of Israel adults use social media (Statista, 2017a) is more realistic. Social media users spend an average of 2 hours and 22 minutes daily on social media (3 hours for people between age 16 and 25; Bayindir & Kavanagh, 2018).

Social networks provide numerous opportunities to share content, converse with others, design a private and public identity, develop and cultivate relationships, develop a reputation, create interactions with like-minded others, and identify available community resources. Social networks make it possible to locate and connect to acquaintances from the past, and quickly remain abreast of events, schedule and document events, create interest groups, disseminate important information, perform marketing activities, and generate social interest (Bayindir & Kavanagh, 2018; Boniel-Nissim, 2010). This communication medium, characterized mainly by interactions with acquaintances, is so common that it constitutes an important tool in managing and maintaining friendships (Bayindir & Kavanagh, 2018; Steinfield et al., 2012). The features of social network website use include anonymity and an absence of face-to-face contact. Anonymity online makes it possible to create free egalitarian gatherings that could not necessarily exist in the real world due to differences of religion, age, race, gender, geographic location, and other factors (Boniel-Nissim, 2010). Nonetheless it appears that the type of online anonymity that characterizes social media networks does not necessary protect privacy as it contains identifying images that often disclose more than do face-to-face interactions (Barak, 2006).

Much research has extensively studied the association between Internet use and psychological well-being, and found that intensive Internet use leads to a decline in interactions among family members. The findings of the HomeNet Project (Kraut et al., 1998) indicate that participants who spend a significant share of their time online reported high levels of loneliness and stress during the day. Another study found that intensive Internet surfing was associated with a high risk of depression (Kraut et al., 2002). Researchers also found that loneliness and depression are associated with risky online behaviors (Ceyhan & Ceyhan, 2008) and regular social media usage (Hunt et al., 2018).

Studies show that online social activity leads to changes in modern attachment patterns in human society, especially in adolescents and young adults (Chukwuere & Chukwuere, 2017; Kontos et al., 2010; Prensky, 2001). The lack of eye contact, which is a prominent feature of the resulting social interactions, leads to high self-disclosure, as textual communications devoid of eye contact invite direct and relaxed conversations (Mesch & Talmud, 2010). Despite the numerous advantages of self-disclosure, which contributes to emotional ventilation, reflection, and alleviates emotional conditions (Hawi & Samaha, 2017; Leung, 2002; Moody, 2001; Smyth, True & Souto, 2001), public exposure may also invite bullying and harassment (Chukwuere & Chukwuere, 2017; Fuchs, 2017; Hinduja & Patchin, 2008). It is also should be noted that virtual friendship is quite different from traditional face-to-face friendship. Preference of virtual friendship leads to a decline in social skills (Bonebrake, 2002; Fuchs, 2017; Kraut et al., 1998).

Another direction of research on Internet use found that individual personality traits affect online surfing outcomes. Introverts experience a decline in community-based activities and an increase in loneliness, while extroverts experience an increase in community-based activities and a decline in loneliness (Kraut et al., 2002). Need for belonging and need for self-representation are two basic social needs that drive social media use.

1.2 Facebook as a Social Network

While social networks offer a large number of platforms, led by Facebook, YouTube, WhatsApp, WeChat, and others, Facebook is the dominant social network worldwide (Statista, 2018a), and in Israel, with over 3.7 million users in Israel (43% of adults, Statista, 2017b). Facebook was found to be a factor in connecting friends (rather than make new contacts; Ellison, Steinfield, & Lampe, 2007, Bayindir & Kavanagh, 2018), a major element in reinforcing social ties and maintaining existing ties, and a means of access to friends' information and emotions. Facebook usage patterns are related to unrestrained conduct and an absence of worries about social evaluation (Joinson, 2007). Facebook created a social-behavioral revolution and a revolution in university students' social skills (Hawi & Samaha, 2017; Sheldon, 2008). Facebook is used by students for various purposes, including maintaining contact with classmates and other members of the department, dormitory residents, and other students (Bayindir & Kavanagh, 2018; Sheldon, 2008). Facebook is also considered "social glue" that helps students adjust to university life (Madge et al., 2009). Some students create profiles that include elements such as political opinions and religious beliefs (Pempek, Yermolayeva, & Calvert, 2009). Studies indicate that students have only several dozen of friends with whom they maintain contact outside the social networks (Ellison,

Steinfield & Lampe, 2007), while the mean number of friends in Facebook is about 300-400.

Studies found that personality traits affect a person's ability to accumulate friends on Facebook. For example, people with social anxiety tend to use Facebook more intensively but report fewer friends, compared to extroverts who tend to use Facebook more moderately yet report having more friends (Sheldon, 2008). Another study that also examined personality effects found that shy people express a high degree of affinity for Facebook yet accumulate fewer friends (Orr et al., 2009). Studies on psychological well-being found that students with low self-esteem and low life satisfaction use Facebook to increase their social capital. Although Facebook has been found to satisfy social needs, it does not as yet satisfy the emotional needs that face-to-face interactions offer (Ellison, Steinfield, & Lampe, 2007; Hawi & Samaha, 2017).

1.3 Social Support

The literature defines social support as a resource provided by others that has a direct or indirect effect on the recipient's behavior and quality of life (Antle, Montgomery, & Stapleford, 2009). Social ties with one's environment are a basic, innate biological need and satisfy numerous individual needs, including the need for education, a secure income, health and concern. Social ties provide a network of individuals and groups that offer encouragement, empathy, and models of behavior and social identity (Barker, 1999). Consequently, social ties are a source of support for individuals, and contribute to their quality of life and physical and psychological well-being. A person's network of social ties constitutes a measure of their social efficacy, participation in society, and at the same time constitutes their social support system (King et al., 2006). Social support is a multi-dimensional concept that concerns social and interpersonal relations, and involves various types of formal and ties, processes (Barker, 1999; Gottlieb & Bergen, 2010; Ryff & Singer, 2000), and resources, including monetary and physical resources, information resources, emotional resources, and social belonging (Oxman & Hull, 1997).

Social support is an environmental and interpersonal variable that constitutes an external coping resource for the individual and satisfies the individual's needs for appreciation, affection, and a feeling of security and belonging. These needs are satisfied through significant others with whom the individual maintains relationships. In the past decade, the virtual sphere — social networks and especially Facebook — has extended the physical space of social ties. The virtual sphere has made us much more "connected."

1.4 Loneliness and Social Networks

Many researchers have addressed the definition of loneliness. The common definition of loneliness is the difference between a person's desire for social relationships and her actual social relationships (Russell et al., 1980). It is important to distinguish between social isolation and loneliness. Social isolation refers to the objective number of relationships in which one is involved, while loneliness reflects one's self-perceived social isolation (Masi et al., 2011). Feeling of loneliness is subjective, and it is the interpretation that an individual gives to his own reality. That is to say, a person can feel lonely even if she is surrounded by people, or can feel socially gratified even if she is involved in a small number of social ties. A feeling of loneliness directs us to seek gratifying social interactions and avoid unsatisfying social interactions (Masi et al., 2011).

Social networks facilitate interpersonal and group communications, and enable conversations between two or more persons who might never meet under ordinary circumstances. Individuals' ability to respond (interactivity) transforms them into an audience that participates in the experiences of another person. The virtual social sphere allows people to maintain social ties "from the real world" and develop them, and at the same time helps people who lack gratifying social ties to construct a social world by creating new friendship ties online (Green & Schleien, 1991).

Numerous researchers have addressed the question of whether virtual social networks constitute an appropriate and satisfying resolution to the feeling of loneliness that teenagers and young adults frequently feel. Hu (2009) found that young people express a statistically significantly greater degree of loneliness after "conversations" on the Internet, compared with the degree of loneliness they express after face-to-face conversations. Dror and Gershon (2012) found a direct association between loneliness and a large number of social network "conversations" with virtual friends. They noted that virtual friendships may be less gratifying than face-to-face friendships. The current study explores whether among young adults, who sense loneliness more from the outset, virtual friendships constitute substitutes for real-life friends, or whether young adults' use of the virtual sphere is the cause of difficulties in creating real-life friendships (Ceyhan & Ceyhan, 2008; Dunbar, 2010). It is important for educators to understand whether loneliness is a cause or a consequence of the use of the virtual social sphere. Such understanding will contribute to the development of focused tools designed to improve social skills and therapeutic conversations with teenagers and young adults who experience loneliness. A recent study by Hunt et

al. (2018) found that "limiting social media decreases loneliness and depression." Indeed, the question, "Do virtual social networks satisfy individual needs or do they exacerbate individuals' feeling of loneliness?" is still open.

1.5 Effects of Gender and Personal Status on Loneliness

An inconsistent picture emerges from the research literature on differences in loneliness among men and women. Most studied that used the UCLA scale (Borys & Perlman, 1985) found no statistically significant differences between feelings of loneliness of men and women, but in studies that found such differences, men scored higher on loneliness than women. In contrast, in everyday social situations, women are more apt to acknowledge feeling lonely, while men are less inclined to do so, due to social stereotypes (Borys & Perlman, 1985). Single individuals with no romantic ties have a higher risk of feeling loneliness (Rokach & Brock, 1998). The fact that individuals who recently concluded a relationship report higher levels of loneliness (Hawthorne, 2018; Wang, Fink & Cai, 2008) illustrates the human need for relationships, and the numerous benefits they offer, and highlights the deficiency manifested as loneliness in individuals without a significant relationship. However, despite the initial belief that married individual are less lonely because they spend most of the day with a related other who knows and understands them, married individuals typically devote more time in their partners and necessarily invest less time in their relationships with family members, friends, and co-workers and therefore may report higher levels of social loneliness. Married men report higher levels of loneliness than married women (Borys & Perlman, 1985). Several studies present a different picture and found that a positive marital relationship constitutes good protection against loneliness (Givertz et al., 2013; Pinquart, 2003). Loneliness also affects the growing population of divorced individuals. Many studies on divorced individuals indicate that divorce tends to cause a loss of personal relationships, which may cause divorced individuals to suffer more strongly from loneliness (Amato, 2000). Furthermore, divorced men reported higher levels of loneliness than divorced women (Dykstra & Fokkema, 2007). Feeling of loneliness increases with age, especially among retired peoples (Dahlberg, Agahi, & Lennartsson, 2018).

1.6 Goals of Our Study

In view of previous findings of an association between loneliness and social network use (Dror & Gershon, 2012; Hu, 2009; Hunt et al., 2018; Sheldon, 2008), the current study explores this association among students of Ariel University in 2018. We assumed that all students of Ariel University access the Internet daily, are aware of social media and have at least ten friends who use social media daily. We also assumed that most of students are young and started to use social media in school and army. Hence, we assumed that usage of and attitudes to social media among Ariel University students are fully determined by their own preferences. We also assumed that students communicate with other students in and out of class, and therefore are effectively not alone. The research question of our study was directed to assess students' loneliness and the association of loneliness with social media use (based on Facebook use) and demographic parameters (age, gender, personal status, etc.). The basic null hypothesis is H_0: "Loneliness is subjective and is not related to demographic parameters or social media use." Alternative hypotheses are the following: H_1: "Loneliness is more strongly associated with demographic parameters than with social media use" and H_2: "Loneliness feelings are associated with social media usage after controlling for demographic differences."

2. Method

2.1 Research Tools

To obtain as broad and comprehensive a picture of the phenomenon under investigation as possible, we used a quantitative research method. A sample of Ariel University students was selected. Students completed questionnaires including binary and quantitative (most in Likert-type scale) questions.

2.2 Sample

The research sample in this study comprised 157 participants, including 75 men (47.8%) and 82 women (52.2%) between the ages of 19 and 33 (as several participants eliminated from the analyses due to missing data, the number of participants in each analysis is specified). Participants were all Hebrew-speaking students of Ariel University enrolled in the Faculty of Social Sciences and Humanities. Participants received a link to an electronic questionnaire. The aims of the study were presented to participants, and all participants completed an informed consent form (which confirms that participants understand their rights, accept the conditions of the study, and are participating willingly in the study) before proceeding to complete the three questionnaires. Questionnaires were completed between April 29, 2018 and May 10, 2018.

2.3 Questionnaire

Participants completed questionnaires (in Hebrew) consisting of three parts: demographics, Facebook usage, and loneliness.

2.3.1 Demographic Questionnaire – Personal Background

This questionnaire was developed for the purpose of this study to collect significant background information on participants. Participants provided information on their age (year of birth), sex (male/female), country of birth (Israel or other and year of immigration), type of housing (with parents/with pair mate/alone), personal status (single/married/divorced), children (yes/no; if yes, number of children), religiosity (religious/traditionalist/secular) and army service completed (yes/no).

2.3.2 Facebook Usage Pattern Questionnaire

The questionnaire includes 8 items (2.1-2.8) designed to assess attitudes and patterns of use on the Facebook social network (Ellison, Steinfield, & Lampe, 2007; internal consistency $\alpha = 0.83$). For items 2.1-2.6, participants noted the degree to which each item describes them on a Likert-type scale from 1 (*very much*) to 4 (*not at all*). In these items, a higher score corresponds to lower linkage with Facebook. Question 2.7 concerned the number of Facebook friends. Question 2.8 was on the daily time spent on social media (based on the previous week).

2.3.3 The Revised U.C.L.A. Loneliness Scale

This scale was originally developed by Russell, Peplau, and Cutrona (1980) and revised several times thereafter. The current study used the third version of this scale (Russell et al., 1984), which contains 17 items (3.1-3.17) that refer to the quality of participants' social ties. Of these, 8 items are positive and 9 items are negative (to obviate the problem of acquiescence bias). Participants rate how often they feel the way described in each item, on a Likert-type scale from 1 (*frequently*) to 4 (*never*). The scale includes negative items reflecting a feeling of alienation (items 3.2, 3.3, 3.4, 3.8, 3.9, 3.10, 3.13, 3.14, and 3.17) and positive items reflecting a feeling of connectedness (items 3.1, 3.5, 3.6, 3.7, 3.11, 3.12, 3.15 and 3.16). Higher scores on positive items indicate greater loneliness.

2.3.4 Additional Measures Related to Loneliness

Four additional loneliness-related items were included to the U.C.L.A. Scale: (4.1) "How many times during the last year did you meet with one of your closest friends?" (4.2) "How many times during the last year did you contact with one of your closest friends in writing (e-mail, letters and cellphone messages)?" (4.3) "How many times during the past year did you participate in leisure activities (recreation, activities, sports activities, etc.) with friends?" (4.4) "Would you like to change or add something to your life as it is today?" In questions 4.1, 4.2 and 4.3, participants responded on a Likert-type scale from 1 (*every day*) to 5 (*several times a year*). Question 4.4 was binary (yes/no). We expected that responses to items 4.1, 4.2, and 4.3 would be positively correlated with loneliness. We also expected that people who feel lonelier would answer "yes" to item 4.4 more often than people who feel less lonely.

2.4 Data Transformation

2.4.1 Scale Unification

To unify the data analysis procedure and to prevent response bias and the effects of outliers, we used the following transformation to a 1-4 scale for items 2.7 and 2.8. For item 2.7 (number of Facebook friends): (1) 500 and more friends; (2) 150-499 friends; (3) 30-149 friends; (4) fewer than 30 friends. For item 2.8 (mean daily time on Facebook): (1) 3 and more hours; (2) 1-3 hours; (3) 15-60 minutes; (4) less than 15 minutes.

2.4.2 Facebook Usage Pattern

Facebook usage patterns were assessed on the basis of *FB* and *FB'* ratings. *FB* was calculated as the mean of inversed rating on items 2.1-2.6 and inversed transformed ratings on items 2.7 and 2.8. *FB'* was calculated as the mean of inversed ratings on items 2.1-2.6 only and based only on the feeling but not on the amounts. Higher *FB* and *FB'* scores correspond to higher connection with Facebook (in contrast to partial items). *FB* and *FB'* were calculated for respondents who responded to at least 6 of 8 or 5 of 6 items, respectively. Possible range of *FB* and *FB'* scores is from 1 to 4.

2.4.3 Loneliness Score

A loneliness score *L* was calculated based on the mean of ratings of positive items and reverse-coded ratings of negative items (see section 2.3). Variable *L* was calculated for respondents who responded to at least 14 of the 17

items. The internal consistency of the U.C.L.A. Scale was proven to be high in various studies (e.g., $\alpha = 0.80$ in Russell et al., 1980, and 0.89-0.94 in many other studies). The scale was also found to be repeatable (repeated measures was $r = 0.73$ after one year; Russell, 1986). High convergent validity was reported with other measures of loneliness. Construct validity of the scale was supported by statistically significant correlations that indicate that scale scores were strongly correlated with quality of social relationships, social support, and psychological well-being. The scale was translated into Hebrew by Hochdorf (1989). Internal consistence for the translated version of the scale was 0.86 (Duvdevani & Naor, 2003).

2.5 Statistical Analysis

To measure associations between the categorical parameters with number of categories k_1 and k_2 (k_1, k_2 = 2, 3) we used χ^2 test (with d.f. = (k_1 -1)(k_1 -1)). To measure associations between continuous variables and binary variables, we used point-biserial correlation coefficient r_{bp}. P-value of such association was calculated using a t-test (where d.f. = n_0+n_1-2 where n_0 and n_1 are the number of respondents in each category). To measure associations between continuous variables and categorical variables, we used a one-way ANOVA. To measure associations between two continuous variables, we used Pearson's correlation coefficient r. To measure associations of ranged variables with ranged or continuous variables we used Spearman's rank correlation coefficient r_s. P-value of associations using Pearson's and Spearman's correlation coefficients were calculated using a t-test (with $d.f. = n$-2 where n is the number of respondents for whom both variables were scored). The following variables were considered continuous: age, number of children, number of years in Israel, L, FB and FB'. Demographic parameters gender, personal status, presence of children, religiosity, country of origin, army service and housing type were considered categorical. Values from items 4.1, 4.2, 4.3 and transformed values from items 2.7 and 2.8 were considered as ranged. Value from binary item 4.4 was considered categorical.

3. Results

3.1 Internal Consistency of Loneliness and Facebook usage Patterns

In our study, the internal consistency of loneliness score L was high, $\alpha= 0.90$. Additional loneliness-related items 4.1 and 4.2 were significantly associated with the loneliness score ($r_s = 0.32$ and 0.19, $t = 4.25$ and 2.36, $p = 0.00002$ and 0.01, respectively). Associations with items 4.3 and 4.4 were found non-significant (for 4.3: $r_s = 0.07$ and $p = 0.56$; for 4.4: $p = 0.20$ in point biserial correlation test, $r_{pb} = 0.11$).

Internal consistencies of FB and FB' were also high ($\alpha = 0.86$ and 0.85, respectively).

3.2 Direct Associations of Facebook Usage and Loneliness

Based on the entire sample (without controlling for differences in demographic parameters), all 20 associations between FB and FB' measures, measures on items 2.7 and 2.8, L scores, and measures on items 4.1 – 4.4 were non-significant (p-value > 0.1).

3.4 Demographic Parameters

Of 157 participants, 75 (48%) were men and 82 (52%) were women. Ages ranged from 19 to 35 (Mean = 25.0, STDV = 2.9). The majority of participants (130, 83%) were single, while 24 (15%) and 3 (2%) of participants were married or divorced, respectively. Only 12 participants (8%) had children (between 1 and 4). Participants self-identified as religious (92 participants, 59%), traditional (37 participants, 24%) or secular (26 participants, 17%). The vast majority of participants were born in Israel (141, 90%). Participants who were born in other countries reported living in Israel between 4 and 29 years. The majority of participants (148, 94%) served in the army. Of all participants, 61 (39%) lived with parents, 31 (20%) lived with a partner, and 65 (41%) lived alone.

Women participants were younger than men (M = 23.9 and M = 26.3, STDV = 2.4 and STDV = 2.9, respectively). Of women participants, 11 (13%) were married, 2 were divorced. Only 4 (5%) women were with children. Women self-identified as religious (52, i.e., 63%), traditional (17, i.e., 21%) or secular (12, i.e., 15%). The majority of women (72, i.e., 88% of 82) were born in Israel, and 76 (93%) served in the army. In total, 37 (45%) lived with their parents, 14 (17%) lived with a partner and 31 (38%) lived alone. Of all male participants, 13 (17%) were married, 1 was divorced. Only 8 men (11% of 75) were with children. Male participants self-identified as religious (40, i.e., 53%), traditional (20, i.e., 27%) or secular (14, i.e., 19%). 69 men (92%) were born in Israel, 72 (96%) served in the army. In total, 24 (32%) male participants lived with their parents, 17 (23%) lived with a partner, and 34 (45%) lived alone. Demographic differences between male and female participants were statistically significant only for age (p-value < 10^{-6} in t-test). Army service was significantly correlated with age (p-value = 0.002): students who had not served in the army were younger.

3.5 Facebook Usage Profile

Mean values for *FB* and *FB'* were 2.69 and 2.53 (STDV = 0.69 and 0.76), respectively. For transformed items 2.7 and 2.8 (number of friends and daily time on Facebook), 157 participants were subdivided on categories (see 2.4.1): (1) 90 (57%) and 44 (28%), (2) 42 (27%) and 61 (39%), (3) 10 (6%) and 31 (20%) and (4) 5 (3%) and 12 (8%), respectively. Differences of these distributions for men and women were found non-significant (*p*-value = 0.23 and 0.37 in χ^2 test). Mean values *FB* for women and men were 2.77 and 2.59, respectively. The difference was non-significant (*p*-value = 0.10). Mean *FB'* values for women and men were 2.66 and 2.38, respectively. The difference was considered significant (*p*-value = 0.02). This finding means that men and women have an almost equal number of Facebook friends and spend equal time on Facebook, but women feel a stronger connection to Facebook. Association of Facebook with age was found non-significant (*p*-value >**0** .1 for all four parameters). Married respondents felt less connected to Facebook than single respondents (*p*-value = 0.02 and 0.03 for *FB'* and *FB*, respectively) although the number of their Facebook friends and time spent on Facebook were non-significantly different (*p*-values = 0.86 and 0.50, respectively). Having children has a non-significant effect on respondents' Facebook usage profile (all four *p*-values were > 0.1, presumably as only few respondents had children).

Religious people used Facebook slightly less than traditional and secular respondents (*p*-value = 0.02 in a 2×4 test) and had fewer Facebook friends (*p*-value = 0.02). Army service and foreign origin had a non-significant effect on Facebook usage (all *p*-values > 0.1). Respondents who lived alone spend more time on Facebook daily than did respondents who lived with their parents (*p*-value = 0.05), but the difference between the time spent on Facebook by respondents who lived alone and respondents who live with a partner was non-significant (*p*-value = 0.09). Difference between the time spent on Facebook by respondents who lived with a partners and respondents who lived with their parents was non-significant (*p*-value = 0.64). Number of friends had a non-significant association with housing type (*p*-value = 0.55). Respondents living with a partner felt a weaker connection to Facebook than did respondents who lived with their parents or respondents who lived alone (*p*-value = 0.04 for *FB'*). Mean Facebook usage profile *FB* was 2.63, 2.46 and 2.85 for respondents who lived with their parents, respondents who lived with a partner, and respondents who lived alone, respectively. These differences were significant (*p*-value = 0.02).

3.6 Loneliness and Related Measures

The mean loneliness score *L* for all participants was 1.82 (STDV = 0.45). The number of participants who gave answers 1 (every day), 2, 3, 4, and 5 (several times a year) in question 4.1 (about offline meetings with friends) were 42 (27%), 69 (44%), 28 (18%) and 13 (8%), respectively. For question 4.2 (communication with friends by writing), the numbers were 111 (71%), 29 (18%), 3 (2%) and 6 (4%), respectively. For question 4.3 (activities with friends), the numbers were 10 (6%), 53 (34%), 9 (6%) and 14 (9%), respectively. For question 4.4 (Would you like to change or add something to the life you run today?" yes/no), 58 (37% of 157) answered "Yes", 69 (44% of 157) answered "No", others preferred not to answer this question. As noted above, items 4.1 and 4.2 were significantly associated with *L* (r_s = 0.32 and 0.19, *p*-value = 0.00002 and 0.01, respectively) while values from 4.3 and 4.4 were non-significant (*p*-value > 0.1).

3.7 Loneliness and Demographic Parameters

Association of loneliness score *L* with gender was non-significant (*p*-value = 0.11). Of all other demographic parameters, *L* was significantly associated only with personal status and housing type (*p*-values = 0.05 and 0.03, respectively). Married respondents (r_{bp} = -0.17) and respondents who lived with a partner felt less loneliness. Associations between item 4.1 (offline meetings with friends) and demographic parameters were non-significant (all *p*-values > 0.16). Association between item 4.3 (communication with friends by writing) and religion was significant (*p*-value = 0.01). Religious men reported engaging less frequently in written communications (*p* = 0.005). In this group of respondents, written communications were associated with age (r_s = 0.16, *p*-value = 0.05). No significant differences between religious and traditional or secular women on this measure emerged (*p*-value = 0.23). Married women participated in activities with friends less frequently than did single women (item 4.3; *p*-value = 0.03). For men, the difference was not significant (*p*-value = 0.65). Other demographic parameters were associated with this value only non-significantly (all *p*-values were > 0.1). Associations between item 4.4 were significant only for gender (women reported a greater desire to change something in their life, *p*-value = 0.04).

4. Discussion and Conclusions

The aim of the current study was to explore the associations between social media usage patterns (based on Facebook) and loneliness among students in higher education institutions. Our research was based on a sample

of 157 students of Ariel University who completed questionnaires online.

First, we verified that the values *FB* and *L* used to assess Facebook usage patterns and loneliness were sufficiently accurate. We found that our calculations of these scores were consistent ($\alpha \geq 0.85$). Second, we tested for the presence of positive correlations between Facebook usage and loneliness that were reported in several previous studies (Dror & Gershon, 2012; Hu, 2009; Hunt et al., 2018; Sheldon, 2008). This finding was not supported by our study: no statistically significant association was found between loneliness and Facebook use (i.e., we do not have sufficient evidence to reject H_1). There are several possible explanations for this result: (a) Measuring social media usage based on Facebook may not be accurate in 2018. For example, young people may spend more time on other social media containing photos, texts, and clips (e.g., Instagram, YouTube). Browsing these media may be time intensive yet not necessarily reflect personal relationships with other users who generate content on these media (Salomon, 2013). (b) Associations between social media usage and loneliness may be community specific. For example, the current sample contained a higher proportion of students who self-identified as religious compared to most other Israeli universities and colleges. Furthermore, the majority participants had additional social experiences (and friendships) from their army service, which is not typical for students in Europe or the United states. The number of secular participants who did not serve in the army was too small to measure the associations between social media usage and loneliness in that group. (c) Facebook use has become an integral part of the educational process, and therefore more intensive Facebook usage may be associated with higher socialization in the education and may be unrelated to insufficient level of emotional communications. (d) Students in our study were required to study in groups at least several times a week. These study practices may have reduced loneliness compared to young adults outside higher education institutions. (e) The size of our sample was insufficient to provide high statistical power for association detection. (f) Results of previous research should be revisited and replicated.

Third, we explored how Facebook usage is associated with respondents' demographic parameters. We found that men and women had similar numbers of Facebook friends and spent similar amounts of time on Facebook but women reported a stronger connection to Facebook (presumably, because women are more emotional, reviewed in McDuff et al., 2017). Students who self-identified as religious used Facebook slightly less than others (possible due to the highly negative stigma of social media in religious communities). Respondents living alone spent more time on Facebook that did respondents who lived with their parents or with a partner, possible due to the greater free time and less criticism of social media "overuse" that people living alone may experience.

Fourth, we tested how loneliness was associated with demographic parameters. Although in some studies loneliness among young adults was associated with gender (reviewed in Borys & Perlman, 1985; Wiseman, Guttfreund, & Lurie, 1995; Nowland, Talbot, & Qualter, 2018), the difference in our study was not statistically significant (L=1.86 an 1.79 for males and females, respectively). Only personal status and housing type were found to be significantly associated with loneliness: respondents who were married or lived with a partner reported less loneliness (hence, we rejected H_0). We did not have sufficient data to assess the effects of children and divorce on loneliness (e.g., Dykstra & Fokkema, 2007).

We also calculated the correlations between four loneliness-related measures (items 4.1-4.4) and demographic measures. For meetings with friends (item 4.1), we found no significant associations. Married women reported slightly fewer activities with friends (item 4.3), presumably because they have less free time. Older religious men engaged in less written communications (item 4.2), which may be a function of the conservatism of religious communities and disapproval of the use of mobile phones that support text messages (e.g., SMS). Female respondents reported a greater desire to change something in their life than did male respondents, but such desires were not significantly associated with loneliness.

The current study has several limitations that may have affected the results. First, we used self-report questionnaires to test our hypotheses. Participants may have failed to complete the questionnaires with due seriousness or honesty, and therefore our research hypotheses were not supported despite the fact that they were grounded in previous findings reported in the literature. Second, the majority of participants are students at Ariel University. The homogeneous nature of the sample may have affected the findings, and we may have obtained different results in a more heterogeneous population.

In view of the growing use of social networks by young men and women, and in view of the fact that young adults have many hours of screen time and spend less time involved in face-to-face interactions with peers, the study of the association between social network usage and loneliness in additional directions is warranted. Although hypothesis H_2 of this study was not supported, previous studies found associations between these variables. As educators, it is important to understand whether loneliness is the cause or the outcome of use of

social media as such understanding will contribute to the development of focused tools to improve social competencies and therapeutic conversations with young adults who experience loneliness.

Acknowledgments

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