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Are the negative effects of social networking a privilege of the rich? Social network usage and life satisfaction across European countries



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ABSTRACT

This paper examines the effect which social network use (SNU) has on individual life satisfaction across 27 different European countries using the 2016 Eurobarometer 86.2 survey from the European Commission (N = 15,039). An ordered probit estimation technique is used to estimate the relationship between SNU and individual life satisfaction. An interaction variable between SNU and country is created and is included in this paper's estimation to show how SNU affects life satisfaction differently across countries. Findings indicate that there are considerable variations across countries regarding the effect which SNU has on life satisfaction. Overall results show that frequent SNU negatively impacts individual life satisfaction, while moderate SNU positively impacts life satisfaction. However, the negative effect associated with frequent SNU is strongest amongst individuals from countries with higher performing economies while individuals from countries with lower performing economies prove more resilient to the negative effects of SNU. This indicates that excessive SNU is most damaging for individuals from high performing economies. We propose that this effect is due to the poorer endowment of social capital in countries with lower performing economies relative to countries with higher performing economies. This lesser level of social capital means that the beneficial effect which SNU provides to social capital, and in turn life satisfaction, is greater in countries with lower performing economies than it is in countries with higher performing economies. This paper provides an important contribution to literature concerning SNU and life satisfaction by examining and reporting disparities between the effect of SNU on life satisfaction across different countries.

1. Introduction

Social network sites such as Facebook, Instagram and LinkedIn are becoming an increasingly central part of everyday life. As of 2020, 69% of people living in Northern America are active on social media with over 223 million users in the United States specifically (Statistica, 2020). Americans are estimated to spend over 1.5 h daily on online social networking sites and 37% would describe social media as an integral part of their daily routine (Statistica, 2020). The strong social network use (SNU) nowadays begs the question how it affects people's well-being and life satisfaction. While, unsurprisingly, excessive SNU in the form of problematic or addictive behaviour should negatively impact one's satisfaction with life, social network sites also allow access to social capital. As such, SNU can have – depending on what moderators and mediators are examined – antithetical effects on life satisfaction.

1.1. SNU and life satisfaction

SNU has become a very prevalent activity within modern society and researchers have long sought to examine the influence which SNU has on levels of individual life satisfaction. Hereby, life satisfaction refers to the conscious evaluation of a person's life which is also commonly conceptualized as the cognitive dimension of well-being (Pavot & Diener, 1993; Pavot, Diener, Colvin, & Sandvik, 1991). Theoretical arguments assert that a certain level of SNU improves an individual's level of social capital and can strengthen social connections (Burke, Marlow, & Lento, 2010; Ellison, Steinfield, & Lampe, 2007) thus positively influencing feelings of well-being. Moreover, virtual spaces may also satisfy other needs than relatedness, for example those for autonomy, competence, self-esteem, physical striving, and self-presentation (Chen, 2019; Partala, 2011). Consequently, it appears logical that – at least to some degree – SNU can enhance an individual's life satisfaction. This was confirmed in a recent

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study which showed that self-actualization need satisfaction mediates the positive effects of safety, belonging, and self-esteem need fulfilment on intention to use Facebook which, in turn, increases life satisfaction (Houghton, Pressey, & Istanbuluoglu, 2020).

However, the current literature surrounding social media does also acknowledge that excessive or addictive levels of SNU can overexpose individuals to the social activities of others and contribute towards feelings of anxiety, isolation, and FOMO (fear of missing out) (Buglass, Binder, Betts, & Underwood, 2017; Howley & Boyce, 2017, p. 17). Two studies utilizing experience sampling found that more extensive social media use led to lower well-being (Kross et al., 2013; Wirtz, Tucker, Briggs, & Schoemann, 2020), an effect that was partly explained by participants' social comparison (Wirtz et al., 2020). Similarly, a nationally representative, American survey which linked health outcomes to Facebook data found that greater "liking" of posts, clicking on links and updating one's Facebook status is associated with reduced life satisfaction (Shakya & Christakis, 2017). These findings suggest that, despite its advantages, SNU can become maladaptive: Indeed, studies explicitly investigating problematic social media usage find negative associations with life satisfaction e.g., Boer et al. (2020), Marttila, Koivula, and Räsänen (2021) Satici and Uysal (2015).

Based on this background, we postulate that some SNU can satisfy people's needs which ultimately leads to a higher satisfaction with life but that, as usage increases and becomes more problematic, benefits will diminish. Moreover, we also conclude that some important mediators and moderators for the association between SNU and life satisfaction exist. As implied earlier, one factor that mediates the relationship between SNU and life satisfaction is the fulfilment of relational needs: A recent, large-scale study found that perceived social support partially mediates the positive relationship between SNU and satisfaction (Oshio, Kimura, Nishizaki, & Omori, 2020). The importance of social capital for human well-being will be described in the following section.

1.2. Social capital, life satisfaction, and SNU

The widespread use of online social networks affects the dynamics of interpersonal interactions: For example, unlike in face-to-face conversations, users can become recipients of other people's self-disclosure without interacting with them (Orben & Dunbar, 2017). At the same time, thanks to large user bases, contacts to others who share interests and hobbies can be established fairly easily. As such, the advancements in modern information technology mean that users of social networks have new ways to build and maintain social capital which may be especially advantageous for self-concealing individuals (Magsamen-Conrad & Greene, 2014). This shows the important role which online social capital can play in contributing to the social capital levels of individuals.

An individual's level of social capital can be considered the quality of their social connections which are acquired through social networks and relationships (Bourdieu, 1986). The theory of social capital asserts that an individual's sense of well-being is influenced greatly by the connections and relationships they have in their day-to-day lives in work, home, and in society generally (Cabras & Mount, 2017; Putnam, 2004; Ziersch, Baum, Darmawan, Kavanagh, & Bentley, 2009) which has been confirmed in empirical studies: Higher levels of social capital have been found to positively influence levels of subjective well-being (see Crowley and Walsh (2018); Kroll (2011); Yip et al. (2007) for examples). Social capital is determined partly by multiple socioeconomic factors (Kaasa & Parts, 2008). Among these socioeconomic factors, the most important variables appear to be educational attainment (Coleman, 1988; Parts, 2013) and income (Pena-López & Sánchez-Santos, 2017) which both increase the likelihood of an individual having higher levels of interpersonal trust and engagement with social groups (Denny, 2003; Paldam, 2000). Theoretical models by Lin (1999) and Pena-López and Sánchez-Santos (2017) emphasise the importance of social structure and resource accessibility in determining levels of social capital. An individual's ability to acquire certain levels of social capital is predicted on

their initial endowment of resources like human capital, wealth, and health and also their ability to develop and accumulate more of these resources through various social networks. Endowment and accessibility to these key resources appear to be greater in more developed and high performing economies (Parts, 2013) which means that base levels of social capital also vary across countries.

As mentioned previously, it is partly because of social network users ability to enhance these social connections and relationships that SNU has been found to positively influence individual well-being and satisfaction (Burke et al., 2010; Ellison et al., 2007). This has been summarized by Clark, Algae, and Green (2018) into a theoretical approach called the interpersonal-connection-behaviours framework. However, when it is considered that social capital and factors which influence social capital vary across countries it could mean that the effect of SNU on well-being also varies across countries. Individuals in countries with low performing economies which are less endowed with social capital may benefit from the type of adaptive SNU which Burke et al. (2010) and Magsamen-Conrad and Greene (2014) find helps individuals in socially challenged positions. In other words, we theorize that SNU influences an individual's level of social capital, and in turn life satisfaction, differently in different countries. Precisely, we propose that, based on its dependence on socioeconomic factors, social capital is easier to access in higher performing economies which makes social networks a comparatively more effective tool for relatedness need satisfaction in lower performing economies. By extension, we theorize that SNU in low-performing economies should have greater positive effects on life satisfaction than in high-performing economies.

While the current stock of knowledge in this area does acknowledge that SNU affects individual well-being and life satisfaction levels, the vast majority of it fails to take account for the context of macroenvironmental factors, despite the acceptance that country-level factors like economic performance play a part in determining levels of social well-being and satisfaction (Chen & Hou, 2019; Crowley & Walsh, 2018). This is by in large due to the tendency of research in this area to focus on single country analysis, making it difficult to show the potentially mitigating impact which national context may have on the effect which SNU has on individual life satisfaction. This presents a knowledge gap within the literature to which this paper directly contributes by conducting a multi-national examination of the effect which various levels of SNU have on individual life satisfaction levels.

1.3. Current study

By examining the impact which SNU has on individual life satisfaction across multiple countries, which are stratified by economic performance, this paper can show the variation of the SNU and life satisfaction relationship between economically high, middle, and low performing countries. It is the theoretical contention of this paper that the sign and size of the effect which SNU has on individual life satisfaction should be positive and greatest in the lowest performing economies. Low performing economies are endowed with lower levels of social capital than high performing economies (Fidrmuc & Gërkhani, 2008; Sissenich, 2010) and as a result the positive influence which SNU has on social capital, and in turn life satisfaction, would be most potent in these countries. This positive effect should diminish in higher performing economies where the endowment of social capital is greater (Knack, 2002; Parts, 2013) and hence the potential positive influence of SNU not as effective.

Given the above theoretical discussion, this paper will examine three different hypotheses. The first hypothesis, **H1**, is based on the idea that SNU, as long as it does not become problematic or an addiction, contributes positively towards social capital and thus, at an aggregate level, should increase levels of individual life satisfaction.

H1. Social network use positively effect individual life satisfaction.

The second hypothesis, **H2**, is based on the idea that levels of social capital vary across different countries and therefore SNU will not raise an

individual's level of social capital in one country to the same level it would in another country. Hence, the influence of SNU on life satisfaction should vary across different countries.

H2. *The effect of social network use on individual life satisfaction varies across countries.*

The third hypothesis, **H3**, is based on the theoretical assertion of this paper that the positive effect of SNU should be strongest in countries with lower performing economies since social capital is more difficult to access in these countries and should diminish in strength in countries with higher performing economies due to already high social capital.

H3. *The positive effect of social network use on individual life satisfaction should be strongest, on average, in countries with lower performing economies and this effect should diminish as economic performance increases.*

2. Methodology

2.1. Participants

The data used for this study is secondary data taken from the Eurobarometer 86.2 survey which covers 35 European countries for the year 2016 with 15,309 valid responses pertaining to 27 countries for this analysis post data cleaning. This survey is conducted by the European Commission and covers the population of the respective nationalities of the European Union Member States, participants had to be residents in one of the 28 Member States and aged 15 years or over. Eurobarometer surveys have been used previously in studies examining life satisfaction levels by [Hessels, Arampatzi, van der Zwan, and Burger \(2018\)](#) and [Lenzi and Perucca \(2018\)](#).

2.2. Measures

Full operationalizations for all measures used in this paper's estimation can be seen in [Appendix 1](#). In order to estimate the relationship between SNU and life satisfaction we used two ordered variables, one which measures life satisfaction and another which measures SNU. The life satisfaction variable is taken from the Eurobarometer data set and coded ordinally from 0 to 3 with 3 being very satisfied, 2 being fairly satisfied, 1 being not very satisfied, and 0 being not at all satisfied. The SNU variable is coded as an ordered variable where 5 indicates whether an individual uses social networking sites daily, 4 indicates that individuals use social network sites 2/3 times a week, 3 indicates that individuals use social network sites once a week, 2 indicates that individuals use social network sites 2/3 times a month, 1 indicates that individuals use social network sites once a month, and 0 indicates if they do not use social networking sites at all. This paper is concerned not just with quantifying the effect which SNU has on life satisfaction, but also how that effect varies across different nation, therefore a dummy variable which indicates the nationality of the individual in question is also included in this paper's model.

Other measures like demographic controls are also used within this paper's estimation to account for factors other than SNU which influence life satisfaction levels. A binary gender dummy variable coded as 1 for male or 0 for female? Is used given that gender has been shown to influence levels of life satisfaction and well-being in previous studies ([Chen, Mark, & Ali, 2016](#); [Gattario, Frisén, Teall, & Piran, 2020](#); [Josh-anloo & Jovanović, 2019](#), pp. 1–8). A binary indicator of unemployment where 1 indicates unemployed and 0 indicates not unemployed is also used as employment status has been shown to influence levels of life satisfaction previous studies which examined life satisfaction and measurements of subjective well-being ([Chen & Hou, 2019](#); [Frasquilho, de Matos, Neville, Gaspar, & de Almeida, 2016](#); [Shen & Kogan, 2020](#)). Given that there is an observed relationship between age and levels of satisfaction and well-being ([Adámek, 2018](#); [An et al., 2020](#); [De Ree & Alessie, 2011](#)), an ordered age variable which increases in orders of decades, i.e.,

20s, 30s, and so on, is used to control for the age of a respondent. Religious belief is frequently proven to be one of the most influential factors in determining life satisfaction in empirical studies ([Desmond, Kraus, & Dugan, 2018](#); [Krause & Ironson, 2019](#); [Ngamaba & Soni, 2018](#)); and as a result, this paper's estimation uses a binary indicator to control for religious belief where 1 indicates the individual is religious and 0 indicates the individual is not religious.

An ordered variable indicating that an individual lives in 0 a rural area or village, 1 a small or middle-sized town, or 2 a large town is used to control for area of residence due to the ongoing debate between rural and urban environments in contributing to the subjective well-being of individuals ([Hand, 2020](#); [Lenzi & Perucca, 2018](#); [Requena, 2016](#)). There is also a bed of empirical evidence which suggests that political orientation or ideology has a significant influence on life satisfaction and/or subjective well-being ([Newman, Schwarz, Graham, & Stone, 2019](#); [Ozmen, Brelsford, & Danieu, 2018](#); [Schlenker, Chambers, & Le, 2012](#)) and as a result this paper controls for political orientation using a measurement which asks individuals how left or right leaning their political views are. Marital status is frequently examined and found to play a significant role in determining individual life satisfaction and well-being ([Carr, Freedman, Cornman, & Schwarz, 2014](#); [Grover & Helliwell, 2019](#); [Stanley, Ragan, Rhoades, & Markman, 2012](#)) and as a result this paper uses a binary indicator control variable indicating whether an individual is married or not. Binary control indicator for parenthood is also used to account for evidence that parenthood plays a significant role in determining life satisfaction ([Pollmann-Schult, 2018](#); [Ugur, 2020](#)). The paper also controls for membership of the working class using a binary indicator considering that social class is continuously found to significantly influence levels of individual life satisfaction and subjective well-being ([Kaiser & Trinh, 2019](#); [Lipps & Oesch, 2018](#); [Raats, Adams, Savahl, Isaacs, & Tiliouine, 2019](#)). Level of attachment to area of residence is an important control variable because it acts as a measurement for the quality of relationships individuals hold within their area. Measurements of attachment are frequently found to influence individual life satisfaction and well-being levels ([Arpino & de Valk, 2018](#); [Nghiem-Phú, 2016](#); [Tsurumi, Imauji, & Managi, 2019](#)) and to control for this factor, the present paper uses an ordered variable indicating if individuals are not at all attached (0), not very attached (1), fairly attached (2), and very attached (3) to their city, town, or village.

2.3. Design

The study design applied a multi-stage, random (probability) design, meaning that in each country, a number of sampling points was drawn with probability proportional to population size (for a total coverage of the country) and to population density. To ensure this the sampling points for the survey were drawn systematically from each of the "administrative regional units", after stratification by individual unit and type of area. They thus represent the whole territory of the countries surveyed according to the EUROSTAT NUTS 1 (or equivalent) and according to the distribution of the resident population of the respective nationalities in terms of metropolitan, urban and rural areas (EC, 2016). A starting address was drawn at random for each sampling point and every Nth address was selected by a standard "random route" procedure, from the initial address. In each household, the respondent was drawn at random (following the "closest birthday rule"). All interviews were conducted face-to-face in people's homes and in the appropriate national language and the identity of the respondents were anonymised to ensure ethical standards were met in the data collection process (EC, 2016).

2.4. Procedure

This paper utilises a large multi-national dataset with over 15,000 observations from 27 different European countries taken from the European Commission's Flash Eurobarometer 2016 survey. An ordered probit estimation technique is used to analyse the relationship between

Table 1
Summary statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
Satisfaction	15,309	2.03	0.74	0	3
Unemployed	15,309	0.09	0.28	0	1
Male	15,309	0.47	0.50	0	1
Age	15,309	54.76	19.34	15	99
SNU	15,309	2.28	2.30	0	5
Right Wing	15,309	3.01	1.12	1	5
Married	15,309	0.39	0.49	0	1
Parent	15,309	0.08	0.27	0	1
Working Class	15,309	0.28	0.45	0	1
Attachment	15,309	2.44	0.71	0	3
Area	15,309	1.01	0.76	0	2
Religious	15,309	0.06	0.23	0	1

SNU and individual life satisfaction. The method of estimation also controls for several individual and demographic controls. Respondents are then stratified by their country's level of economic performance. Three tiers of economic performance are developed, and we observe variations in the direction and size of the effect which SNU has on levels of life satisfaction for individuals from high, middle, and low performing economies.

2.5. Analysis

An ordered probit model with clustered standard errors is used to estimate the probability of the independent variables effecting levels of life satisfaction. The ordered probit estimation technique has been used previously in well-being studies like [Crowley and Walsh \(2018\)](#) and [Habibov, Auchynnikava, Luo, and Fan \(2019\)](#). An ordered probit model is appropriate for the context of the present research design as it allows the analysis of an ordinal dependent variable with ordered values (in this case life satisfaction ranging from least to most satisfied). Linear regression in this case would not be adequate as interval distances between increments of the used 4-point Likert scale cannot be assumed. The ordered probit model can be seen illustrated below in equation (1) which is a reproduction of the equation used by [Gujarati \(2015\)](#) to illustrate ordered multinomial models.

$$Y_i^* = \sum_{n=1}^K \beta_n X_{in} + u_i \tag{1}$$

Where is the ordered dependant variable and X represents the regressors in the model and u is the error term. Y_i^* is often referred to as the latent or index variable which denotes the ordered level of a dependant variable, in this case an individual's level of life satisfaction.

Equation (2) will be used to analyse the selected determinants of life satisfaction.

$$LS_{ic} = \beta_0 + \beta_1 SNU_{ic} + \beta_2 Unemployed_{ic} + \beta_3 Male_{ic} + \beta_4 Age_{ic} + \beta_5 RW_{ic} + \beta_6 Married_{ic} + \beta_7 Parent_{ic} + \beta_8 WC_{ic} + \beta_9 Attachment_{ic} + \beta_{10} Area_{ic} + \beta_{11} Rel_{ic} + \beta_{12} SNU * Country_{ic} + \mu_{ic} \tag{2}$$

Where LS is the level of life satisfaction which person i has living in country c . Life satisfaction indicates whether person i is very, fairly, not very, or not at all satisfied with their life. SNU indicates how frequently person i uses social networking sites in accordance with the ordered levels of SNU specified in section 2. $\beta_{12} SNU * Country_{ic}$ is an interaction term between social network use and country. The coefficient of this β is of particular interest because it will show whether or not the effect which SNU has on an individual's life satisfaction varies across countries. Standard estimation and diagnostics for statistical issues are performed to ensure the robustness of the model. To account for heteroscedasticity a post estimation command variance-covariance matrix (VCE) is used. This computes robust standard errors which are the square root of the

Table 2
National representation of respondents.

Country	N	%	Country	N	%
Germany	1024	6.69	Croatia	531	3.47
Sweden	846	5.53	Ireland	510	3.33
GB	831	5.43	Slovakia	509	3.32
Finland	728	4.76	Latvia	504	3.29
Denmark	698	4.56	Bulgaria	490	3.2
Belgium	687	4.49	Greece	464	3.03
Netherlands	670	4.38	Poland	435	2.84
Austria	638	4.17	Portugal	432	2.82
Czech Rep	638	4.17	Slovenia	426	2.78
France	617	4.03	Romania	406	2.65
Hungary	595	3.89	Italy	325	2.12
Lithuania	564	3.68	Luxembourg	245	1.6
Spain	553	3.61	Malta	208	1.36
Estonia	535	3.49	Cyprus	200	1.31

variances of (diagonal elements) of the VCE and produces robust variance estimates ([StataCorp, 2013](#)). A correlation matrix is provided in [Appendix 2](#) to ensure there was no evidence of multicollinearity in the model.

3. Results

3.1. Sample overview and demographics

Summary statistics for the variables of interest and the control variables of the study can be seen below in [Table 1](#).

As can be seen above in [Table 1](#), the average response for level of life satisfaction is 2.03 indicating the average individual in the data is 'Fairly Satisfied' with their life. There is a relatively even split between male and females in the sample with the average value of 0.47 for the male variable indicating that there are slightly more female than male respondents in this data set. The average age of respondents is just under 55 years of age and the vast majority (over 90%) are employed. In addition to this, the majority of the respondents are not married, not parents, not religious, not working class, live in a small to medium-sized town, which they are 'fairly attached' to, and centre leaning in political matters. In terms of the participants' national distribution, there is a fairly even representation in the data set with no nationality making up more than 6.7% of the sample and no nationality making up less than 1.3% of all subjects. The exact distribution of nationalities can be seen below in [Table 2](#).

3.2. Testing of hypotheses

The results for the ordered probit estimation for SNU excluding country and other control variables can be seen below in [Table 3](#). The coefficients indicate the direction and size of the effect which different orders of SNU have on individual life satisfaction.¹ They are reported in reference to their base (or reference) category, which in this case is not engaging in SNU at all. The sign and value of the coefficient therefore indicates the direction and size of the effect which SNU has on life satisfaction relative to an individual that does not engage in SNU at all.

Regarding our first hypothesis (stating "Social network use positively effects individual life satisfaction."), results indicate that SNU impacts the life satisfaction of individuals at an aggregate level negatively if they engage in SNU once a month, two/three times a month or once a week compared to not using social networks at all. The most severe of these being 'once a week' which is significant with a coefficient value of -0.45, $p = .03$, followed by 'once a month' with a value of -0.22, $p = .02$, and then two/three times a month at -0.08, $p = .02$. SNU appears to have a positive effect on life satisfaction when used either 'two/three times a week' or 'every/almost every day'. Specifically, SNU twice or thrice a

¹ Results for the remaining control variables and individual country effect in the model can be found in [Appendix 3 and 4](#) respectively.

Table 3
Ordered probit results for social network use.

Variables	Coefficients
No SNU	Reference Category
SNU Once a Month	−0.22*** (0.02)
SNU Two/Three Times a Month	−0.08*** (0.02)
SNU Once a Week	−0.45*** (0.03)
SNU Two/Three Times a Week	0.33*** (0.03)
SNU Every/Almost Every Day	0.32*** (0.04)

Robust standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

week being the more positive of these two with a significant coefficient value of 0.33, $p = .03$, compared to the significant but slightly lower value of 0.32 for every/almost every day, $p = .04$. These results suggest that higher levels of SNU would be positively associated with individual life satisfaction and that lower to mid-levels of SNU is negatively associated with individual life satisfaction. This finding provides partial support for H1 as it indicates that at an aggregate level, certain levels of SNU positively influence individual life satisfaction. Therefore, we can partially accept H1 which asserts that SNU should positively influence individual life satisfaction conditionally. Though, it should be pointed out that infrequent levels of SNU appear to have a negative effect on individual life satisfaction at an aggregate level.

Regarding our second hypothesis (stating “*The effect of social network use on individual life satisfaction varies across countries.*”), we interact country dummies with the SNU variable to show international variations in the effect which SNU has on individual life satisfaction. The results of SNU interacted with country can be seen below in Table 4 and show the interaction coefficients associated with SNU in each individual country.

These results show that the overall relationship between SNU and life satisfaction is mostly positive when individuals use it only once a week. Once a week SNU can be considered as a moderate level of SNU. The relationship then becomes more negative at the most frequent order of SNU which is every day or almost every day. This trend can't be considered applicable to every case however as we see that there are clearly individual variations in the sign and size of the effect in different countries. For example, in Luxemburg and Ireland we see that the coefficients associated with every day SNU are both negative with values of $-0.28, p = .01$, and $-0.35, p = .01$, respectively. Whereas the coefficients for the same level of SNU in Romania and Bulgaria are both positive at $0.32, p = .01$, and $.30, p = .01$, respectively. The clear difference in sign and size of effect here for the same level of SNU indicates that we can accept H2: The effect of SNU on individual life satisfaction varies across the investigated countries.

To answer our third hypothesis, H3, (stating “*The positive effect of social network use on individual life satisfaction should be strongest, on average, in countries with lower performing economies and this effect should diminish as economic performance increases.*”), we stratify the investigated 27 countries into three groups of nine based on their level of gross

² 6 out of 135 of the coefficients had to be omitted from this analysis because there was either no observation for that country's category (Malta is NA for 2/3x Month) or the coefficients associated with it were statistically significant and therefore were meaningless in terms of predictive power. It would therefore be wrong to include them in this analysis because their values would influence the relationship despite being spurious. However, for the sake of robustness this analysis was also conducted with all these values and displayed in Appendix 5 which shows there is nearly no difference in results. The only value which changes is the value for Everyday/Almost Everyday use in the case of the middle 9 economies. The value is -0.13 in the first analysis in Fig. 1 and -0.14 in the second analysis in Appendix 5.

domestic product (GDP) per capita, taken from Penn World Tables provided by Feenstra et al. (2015), and get the mean coefficient value for those three groups.²

We can see that the relationships between life satisfaction and SNU appear to differ slightly between high (Luxembourg, Ireland, Austria, Netherlands, Germany, Denmark, Sweden, Belgium, Finland), middle (U.K., Italy, Malta, Spain, Czechia, Cyprus, Slovenia, Slovakia, Estonia), and low performing economies (Lithuania, Portugal, Poland, Hungary, Latvia, Greece, Croatia, Romania, Bulgaria)³ & ⁴.

As can be seen above in Fig. 1, increased levels of SNU in the top 9 performing economies is only positively associated with life satisfaction when it is used either once a month (infrequently) or once a week (moderately) which have interaction effect coefficients of 0.51 and 0.41 respectively. In every other instance the effect is negative. The effects of SNU for individuals from the middle 9 performing economies are all positive apart from the coefficients for two or three times a week usage and every day or almost everyday usage with values of -0.28 and -0.13 respectively. The most positive order of use for individuals from the middle 9 performing economies is moderate use (0.92) whereas the most negative is the already stated two or three times a week usage. In the case of the bottom 9 performing economies the effect between SNU and life satisfaction is positive in all but one category, the two or three times a week usage which has a value of -0.10 . Individuals in the bottom 9 performing economies in this sample appear to be negatively impacted by SNU to a lesser extent than individuals in higher performing economies. The effects of everyday or almost every day SNU is even positive at 0.07. These results indicate that the effect which SNU has on individual life satisfaction is on average most beneficial in countries with lower performing economies and least beneficial in countries with higher performing economies. This pattern of behaviour can be illustrated below in Fig. 2.

As can be seen in all instances increased levels of SNU are associated with diminishing levels of life satisfaction, however, the level of diminishing life satisfaction is more intense in higher performing economies. In the instance of the bottom 9 performing economies the trendline for the effect SNU has on life satisfaction still diminishes with increased levels of use, despite this, the value is still positive even at the highest level of use. This indicates that there remains a positive relationship between SNU and life satisfaction in the least economically developed countries investigated here even at the highest level of SNU. This provides evidence for the acceptance of H3: The positive effect of SNU on satisfaction with life is stronger and more observable in lower performing economies while the benefits of SNU are generally lower and diminish faster in high performing economies.

4. Discussion

This paper's analysis looked at the relationship between frequency of SNU and individual life satisfaction. It first looked at this relationship at the aggregated level for over 15,000 individuals from 27 different countries. The partial acceptance of H1 (stating “*H1: Social network use positively effect individual life satisfaction.*”) occurred because at the aggregated level it was observed that certain levels of SNU were positively associated with life satisfaction. Social capital theory can offer an

³ A full table of the values for GDP per capita for each country from the year 2016 can be seen in Appendix 6.

⁴ Additionally, a number of the countries in the dataset are former communist nations. As being a formerly communist states tends to have a significant impact on the economic growth of these countries (Dincă and Dincă, 2015) it seems appropriate to specify which countries these are in Appendix X. While a formerly communist variable was constructed in the data set, it could not be included in the model for the ordered probit estimation due to issues with multicollinearity leading it to be omitted automatically by the Stata software. See greater discussion of this in Appendix 7.

Table 4
Ordered Probit Results for Social Network use Interacted with Country.

Economic Performance	Country	1x Month	2/3x Month	1x Week	2/3x Week	Every Day
High Performing	Luxembourg	0.37*** (-0.01)	-0.81*** (-0.02)	0.56*** (-0.02)	-0.27*** (-0.02)	-0.28*** (-0.01)
	Ireland	-0.01 (-0.01)	0.04** (-0.02)	0.22*** (-0.02)	-0.15*** (-0.02)	-0.35*** (-0.01)
	Austria	0.52*** (-0.02)	0.31*** (-0.02)	0.34*** (-0.01)	-0.16*** (-0.01)	0.13*** (-0.01)
	Netherlands	0.40*** (-0.02)	0.28*** (-0.03)	0.37*** (-0.02)	-0.55*** (-0.02)	-0.28*** (-0.02)
	Germany	0.47*** (-0.01)	0.30*** (-0.03)	0.50*** (-0.02)	-0.38*** (-0.01)	-0.19*** (-0.01)
	Denmark	0.87*** (-0.02)	-0.41*** (-0.02)	0.59*** (-0.01)	-0.31*** (-0.01)	-0.17*** (-0.01)
	Sweden	0.24*** (-0.01)	-0.17*** (-0.01)	0.32*** (-0.02)	-0.54*** (-0.02)	-0.40*** (-0.01)
	Belgium	0.68*** (-0.02)	0.32*** (-0.02)	0.20*** (-0.02)	-0.24*** (-0.01)	-0.25*** (-0.01)
	Finland	0.51*** (-0.02)	-0.28*** (-0.02)	0.58*** (-0.02)	-0.49*** (-0.02)	-0.37*** (-0.01)
	Middle Performing	UK	-0.10*** (-0.01)	-0.61*** (-0.02)	0.06*** (-0.02)	-0.49*** (-0.01)
Italy		0.48*** (-0.02)	0.31*** (-0.02)	0.34*** (-0.02)	-0.32*** (-0.02)	-0.12*** (-0.01)
Malta		-0.27*** (-0.05)	NA	5.20*** (-0.24)	-0.75*** (-0.03)	-0.38*** (-0.02)
Spain		0.30*** (-0.02)	0.41*** (-0.02)	0.63*** (-0.02)	-0.10*** (-0.01)	-0.30*** (-0.01)
Czech		0.14*** (-0.02)	-0.11*** (-0.01)	0.50*** (-0.02)	-0.21*** (-0.02)	-0.18*** (-0.01)
Cyprus		0.45*** (-0.02)	0.80*** (-0.04)	0.37*** (-0.04)	-0.03*** (-0.03)	0.07*** (-0.02)
Slovenia		0.37*** (-0.02)	0.51*** (-0.04)	0.61*** (-0.02)	0.02 (-0.02)	0.19*** (-0.01)
Slovakia		0.35*** (-0.02)	0.27*** (-0.02)	0.32*** (-0.02)	-0.14*** (-0.02)	0.05*** (-0.02)
Estonia		0.06*** (-0.01)	0.45*** (-0.02)	0.29*** (-0.02)	-0.21*** (-0.01)	-0.01 (-0.01)
Low Performing		Lithuania	0.45*** (-0.02)	-0.47*** (-0.02)	0.73*** (-0.03)	-0.54*** (-0.02)
	Portugal	0.96*** (-0.02)	1.95*** (-0.04)	0.82*** (-0.02)	0.12*** (-0.01)	0.21*** (-0.01)
	Poland	-0.14*** (-0.01)	-0.19*** (-0.02)	0.46*** (-0.02)	-0.08*** (-0.01)	-0.14*** (-0.01)
	Hungary	0.30*** (-0.03)	-0.02*** (-0.02)	0.66*** (-0.02)	-0.16*** (-0.01)	-0.17*** (-0.01)
	Latvia	0.61*** (-0.02)	-0.20*** (-0.02)	0.65*** (-0.02)	-0.31*** (-0.01)	0.01 (-0.01)
	Greece	0.65*** (-0.03)	0.54*** (-0.04)	0.97*** (-0.03)	-0.05*** (-0.01)	0.11*** (-0.01)
	Croatia	0.11*** (-0.01)	0.24*** (-0.02)	0.33*** (-0.02)	0.28*** (-0.02)	-0.02** (-0.01)
	Romania	1.09*** (-0.03)	0.39*** (-0.03)	0.41*** (-0.02)	-0.02 (-0.02)	0.32*** (-0.02)
	Bulgaria	0.64*** (-0.04)	0.48*** (-0.02)	1.37*** (-0.04)	-0.08*** (-0.03)	0.30*** (-0.02)

Robust standard errors in parentheses ***p < 0.01, **p < 0.05, *p < 0.1.

explanation to this result. Social capital theory indicates that an individual's connections and relationships should impact their sense of well-being (Cabras & Mount, 2017; Ziersch et al., 2009). In addition to this, SNU can be used to positively influence an individual's social connections and relationships (Burke et al., 2010; Ellison et al., 2007). Thus, higher levels of SNU appear to be positively associated with life satisfaction at an aggregate level. Although it should be noted that there seems to be variations in this effect when we look at the data at a more segregated level.

The paper also investigated the relationship between life satisfaction and SNU from a multi-country perspective. This multi-country method of analysis was important to the research and allowed us to examine the extent to which a country's level of economic performance influences the effect which SNU has on individual life satisfaction. The national

economic performance in this case was used as a proxy predictor for the level of social capital which was present within the country. The acceptance of H2 (stating "The effect of social network use on individual life satisfaction appears to vary across countries.") and H3 (stating "The positive effect of social network use on individual life satisfaction should be strongest, on average, in countries with lower performing economies and this effect should diminish as economic performance increases.") in this paper provides evidence that the relationship between SNU and life satisfaction does vary across country and that national context is important to account for in future research in this area. The over tendency of SNU and well-being research to focus on single-country analyses which does not allow to take potential national differences into account is something which we are explicitly addressing in this paper. National factors should, and do, influence the relationship between SNU and life satisfaction since digital

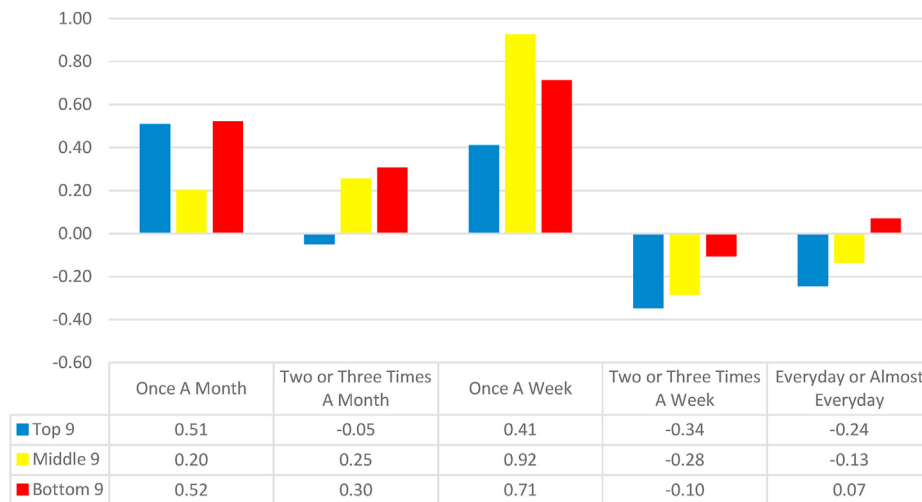


Fig. 1. Mean interaction effects of social network use on life satisfaction across differently performing economies.

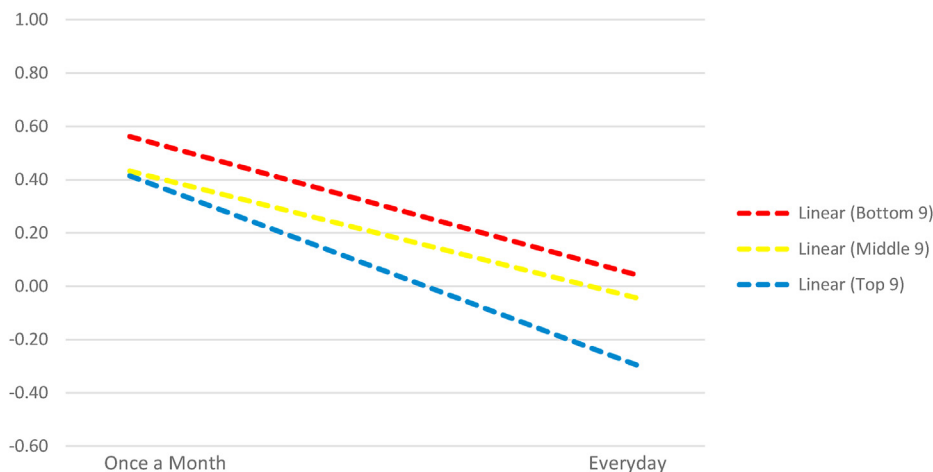


Fig. 2. The diminishing marginal benefit of social network use across differently performing economies.

networks allow people who lack support in real life to access social capital online.

Indeed, our findings suggest that both the level of an individual's SNU and national economic performance affect an individual's life satisfaction. Major findings of this study are: 1) using social networks two times a week to every day can have positive effects on life satisfaction; 2) the effect of SNU on an individual's life satisfaction varies across countries, meaning that macro-level variables affect the relationship between social media usage and well-being; and 3) that one macro-level factor which explains this variance is national economic performance.

Hence, our findings are in line with research that showed while a positive effect of information technology on well-being may exist, there are diminishing marginal returns for people who already have much access to it (Graham & Nikolova, 2013). In underperforming economies, individuals live in more difficult circumstances: These circumstances infringe on their ability to engage and encounter social relationships which have been found to be positively associated with life satisfaction and other measurements of well-being (Crowley & Walsh, 2018; Helliwell, Aknin, Shiplett, Huang, & Wang, 2017; Wheatley & Buglass, 2019). In these underperforming economies, SNU seems to provide greater benefit and lesser costs because it helps individuals in disadvantaged circumstances to overcome their socio-economic difficulties in the same way Magsamen-Conrad and Greene (2014) find that interaction via internet technology helps improve the well-being and life satisfaction

levels of individuals who are in socially disadvantaged positions. Modern information technology, like in the form of online networking sites, allows individuals to build and maintain social connections with others. As mentioned above, people in lower performing economies may have more problems building social capital and thus, using social networking platforms could be an adaptive behaviour. In contrast, the individuals living in higher performing economies may not share these disadvantages to the same extent as individuals in lower performing economies, so they do not incur this alleviating benefit which SNU provides. As a result, the negative aspects of SNU, like exposing individuals to the seemingly better lives of others and FOMO (fear of missing out) which induce feelings of social exclusion (Buglass et al., 2017; Fuster, Chamarro, & Oberst, 2017; Howley & Boyce, 2017, p. 17), can become the main impact associated with frequent SNU.

4.1. Practical implications

Based on this background, our study has some practical implications: Specifically, on an individual level, we suggest social network users critically examine how frequently they are using social media. Moderate levels of SNU are associated with higher levels of life satisfaction, however, very frequent SNU which is more so associated with negative effects to life satisfaction. This is most likely because high frequency levels of SNU are more closely related to problematic type use where individuals

show signs of behavioural addiction or they impair their social connections as a form of phubbing which would be expected to ultimately harm their well-being.

On a larger scale, our findings also have relevancy for policy makers and social workers: individuals concerned with the welfare of socially isolated or disadvantaged persons should be aware of the potential advantage which SNU can provide to the social capital and life satisfaction of individuals in lower performing areas. However, they should also be aware of the problematic effects which excessive SNU can have on individuals, particularly individuals in higher performing areas.

4.2. Theoretical implications

This research rested on a number of theoretical assumptions: SNU as well as higher economic status provide access to social capital which in turn leads to an increase in life satisfaction (Clark et al., 2018). Since social capital can be more easily accessed in high-performing economies, the positive effect of SNU on life satisfaction, through a mechanism of relatedness need fulfilment, should be greater for lower-performing economies. Moreover, SNU can also deteriorate well-being when behaviour becomes problematic; in other words, too much SNU decreases life satisfaction, an effect that should be less intense in lower-performing economies due to lower base levels of social capital in these countries.

This aligns with prior research which showed that SNU generally can have benefits for life satisfaction so long it fulfils human needs and facilitates connections, e.g., Houghton et al. (2020), whereas problematic, addicted SNU can have the opposite effect, e.g., Boer et al. (2020); Kross et al. (2013); Marttila et al. (2021); Satici and Uysal (2015); Wirtz et al. (2020). Our work expands on the theoretical position of Clark et al. (2018) by showing that not only individual behaviour (creating meaningful connections vs. being isolating) but also macro-level variables are relevant explanatory factors. Specifically, we advance the theories relating to SNU and life satisfaction by showing that the beneficial effects of SNU on life satisfaction vary based on the level of economic performance in the country an individual lives in.

4.3. Limitations and future studies

This paper has made a valuable contribution to the literature by examining the relationship between SNU and individual life satisfaction across multiple countries in Europe; however, a limitation of the present research is that respondents' actual social capital could not be taken into account as it is done by Crowley and Walsh (2018). Due to data limitations the paper also can't account for the size of the online social network of each individual. In addition to this, the type of SNU is not disclosed in the survey so we cannot differentiate between different types of social network sites as is done by Caers and Castelyns (2011) and Doğan (2016). As Chan (2015) showed, different mobile phone uses can have contrasting effects on a person's well-being and affect; hence, similar differences might exist for social networks in general. This assumption is supported by Phua, Jin, and Kim (2017) who found that social network sites provide differing amounts of social capital and by Kim and Shen (2020) who found that varying Facebook activities are associated with life satisfaction to differing degrees. Future studies may want to address this by comparing social networking sites, assessing social capital and including it as a mediating variable.

Future research in this area will hopefully adopt a more multi-national approach as is done in this paper to continue to examine the affect SNU has on individuals in different countries. Potential avenues for future research in this area could be examining this relationship between developed and developing countries. There are larger gaps in social capital between developed and developing nations (Escandon-Barbosa, Urbano-Pulido, & Hurtado-Ayala, 2019) which could cause a larger variation in the effects of SNU on life satisfaction. The findings of this paper would indicate that SNU should have a more positive effect on

individual life satisfaction in developing nations outside of Europe. There are also differences in levels of social capital between rural and urban areas within the same country (Cabras & Mount, 2017; Ziersch et al., 2009) so it would be of interest to examine if the benefits of SNU are more potent in rural areas than in urban areas. This regional analysis approach would be of a big interest to policy makers concerned with assisting the well-being of individuals in more isolated communities.

5. Conclusion

Since online social networks are becoming an increasingly central part of daily life, it is important to understand how their use is related to people's life satisfaction. While they provide opportunities to meet needs for relatedness, extensive SNU can negatively impact users' satisfaction with life. This study suggests that the diminishing benefits of SNU are partly explained by GDP whereupon higher national economic performance translates to less benefits from SNU compared to lower-performing economies. Precisely, we propose that GDP is a relevant moderator since it can be viewed as a proxy for how easily social capital can be accessed in real life. Future studies should control for social capital when examining the association between social media use and well-being.

Declaration of competing interest

The authors have no competing interests to declare. All authors have materially participated in this research and article preparation. All authors have approved the final article. The authors received no financial support for the research, authorship, and/or publication of this article.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.chbr.2021.100078>.

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