



Life satisfaction in the digital age: The role of smartphone use and experience

Elsy Verhofstadt^{a,*}, Luc Van Ootegem^a, Arthur Jacobs^a, Mariek Vanden Abeele^b

^a Department of Economics, Ghent University, Sint-Pietersplein 6, 9000, Gent, Belgium

^b IMEC-MICT, Ghent University, Platteberg 11, 9000, Gent, Belgium

ARTICLE INFO

Keywords:

Smartphone use
Smartphone well-being
Online vigilance
Life satisfaction

ABSTRACT

In today's 'always-connected' world, people spend hours online using their smartphones. This study contributes to ongoing debates examining how smartphone use and smartphone use experience relate to life satisfaction. We distinguish smartphone use by purpose and timing, and we are interested in how individuals experience this use (their online vigilance and smartphone well-being). Combining information on use and experience allows us to examine both their associations with life satisfaction and how the link with smartphone use varies depending on the user's experience. Using data from 2259 adults in Flanders, the analysis also considers heterogeneity across socio-economic groups. Findings show that the relationship between smartphone use and life satisfaction depends on both the type and timing of use. Social media use is more negatively associated with life satisfaction than communication app use, particularly during non-work periods. Smartphone use experience is negatively associated with life satisfaction at the bivariate level, but these associations largely disappear once usage patterns are accounted for. This finding suggests that experiences are closely intertwined with how smartphones are used. Moreover, smartphone use experience primarily acts as a moderator, shaping whether smartphone use is associated with more positive or negative outcomes. We observe heterogeneity across socio-economic groups, with more complex patterns among students and more limited associations among employed and non-active individuals. Overall, the findings highlight the ambivalent and context-dependent nature of smartphone use in relation to life satisfaction.

1. Introduction

Digitalization, and in particular the widespread adoption of smartphones, has been associated with substantial changes in everyday life over recent decades (OECD, 2019). These developments are visible across various domains, including education (e.g., online learning), healthcare (e.g., diabetes monitoring apps), commerce (e.g., online shopping) and financial services (e.g., digital banking). Changes have been especially pronounced in the domains of communication and (des) information exchange. The daily time spent on social networking by internet users worldwide is on average about 145–150 min in the period 2020–2024 (Statista, 2024).

Smartphone use has increased markedly over time. Within the EU27, the share of individuals using mobile internet via smartphones rose from 62% in 2016 to 90% in 2025 (Eurostat, 2026). At the same time, the possibilities that the smartphone creates are expanding. In parallel with

these developments, concerns have been raised about potential challenges associated with smartphone use, including issues related to privacy and misinformation. All these changes significantly impact individuals' well-being. In this paper, we will use life satisfaction as the proxy for well-being. Using life satisfaction as a measure for well-being has both advantages and limitations (Dolan et al., 2017; OECD, 2023). Life satisfaction scores can be compared across different populations and over time, but they can be influenced by the mood of the day, by varying interpretations across cultures and by socially desirable answering. Review studies (Cataldo et al., 2024; OECD, 2023, 2024; Helliwell et al., 2022) indicate that life satisfaction is influenced by a range of factors, including better health, higher income or wealth, good housing, strong social relationships and achievements, and personality traits (e.g., optimism). Recently, the question of how an individual's well-being or life satisfaction relates to the use of digital technologies has received increasing attention.

* Corresponding author.

E-mail addresses: Elsy.Verhofstadt@UGent.be (E. Verhofstadt), Luc.VanOotegem@UGent.be (L. Van Ootegem), Arthur.Jacobs@UGent.be (A. Jacobs), Mariek.VandenAbeele@UGent.be (M. Vanden Abeele).

<https://doi.org/10.1016/j.chbr.2026.101172>

Received 30 September 2025; Received in revised form 16 June 2026; Accepted 16 June 2026

Available online 16 June 2026

2451-9588/© 2026 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY-NC license (<http://creativecommons.org/licenses/by-nc/4.0/>).

Drawing on a specific dataset collected in Flanders (Belgium), this study examines how smartphone use and smartphone use experience are associated with life satisfaction. We distinguish between three analytically distinct but related concepts. First, smartphone use refers to behavioral indicators capturing what individuals do with their smartphones, including both purpose and intensity of use. Second, smartphone use experience refers to the subjective evaluation of that use, operationalized through two constructs: online vigilance and smartphone well-being. Third, life satisfaction captures the overall evaluation of well-being.

The remainder of the paper is structured as follows. Section 2 reviews the literature on smartphone use and life satisfaction, distinguishing between smartphone use (subsection 2.1) and smartphone use experience (subsection 2.2). Subsection 2.3 presents the research focus and contribution of this study. Section 3 describes the data and the methodology. Section 4 presents the empirical results. Section 5 concludes and points to some limitations and future challenges.

2. Life satisfaction, smartphone use and smartphone use experience

2.1. Smartphone use

Some studies find positive associations between smartphone use and indicators of well-being. Chan (2015) finds that mobile phone use for communication is positively related to subjective well-being. Lin and Zhou (2025) find that specific smartphone activities—especially mobile shopping and mobile health app use—are positively associated with life satisfaction.

At the same time, other studies find no or negative associations. For example, große Deters and Schoedel (2024) do not find a consistent association in a longitudinal survey study. In addition, research on excessive and problematic smartphone use frequently reports negative associations with life satisfaction (e.g., Brailovskaia et al., 2023; Horwood & Anglim, 2019; Suárez Álvarez & Vicente, 2024). Some studies identify specific mechanisms associated with lower life satisfaction, such as exposure to upward social comparison through social media (Olivos et al., 2021). Other work indicates that smartphone use can be negatively associated with well-being when it interferes with face-to-face social interactions (Anderl et al., 2024).

Overall, previous research suggests that the association between smartphone use and well-being depends on how and when smartphone use occurs (Kushlev & Leita, 2020). For example, Brodersen et al. (2022) report stronger associations during weekends, whereas Woo et al. (2021) find more negative outcomes during weekdays. Woo et al. (2021) also show that limited social use during weekdays is not associated with mental health risks, whereas extended non-social use is. Furlan and Meggiolaro (2025) report that communication app use is positively associated with life satisfaction, while entertainment use shows no significant association.

The studies reviewed a range of well-being indicators and examined different types of smartphone use; they illustrate the diversity of findings in the literature. In the empirical analysis, we focus specifically on life satisfaction and the dimensions of smartphone use and experience.

2.2. The experience of smartphone use: online vigilance and smartphone well-being

In addition to the use of a smartphone as such, it is relevant to examine how people experience their smartphone use. In this study, we focus on two constructs of smartphone experience: online vigilance and smartphone well-being.

2.2.1. Online vigilance

Mobile communication platforms encourage frequent checking of messages and updates (Oulasvirta et al., 2012). This is linked to the

emergence of a lifestyle in which individuals remain continuously attentive to online interactions. Reinecke et al. (2018) refer to this as online vigilance.

Online vigilance consists of three subdimensions: salience, monitoring and reactivity. Moments of high online vigilance are characterized by high cognitive preoccupation with the online sphere, frequent monitoring behavior over digital information and communication streams and highly responsive behavior to any incoming message or request. Recent studies indicate that online vigilance is associated with lower well-being, higher stress and cognitive fatigue (Freytag et al., 2021; Johannes et al., 2020; Li et al., 2024; Van Gaeveken et al., 2024), although Johannes et al. (2018) do not find a direct association with life satisfaction.

In sum, although evidence on the correlates of online vigilance remains limited, the available research largely suggests that higher online vigilance co-occurs with poorer well-being.

2.2.2. Smartphone well-being

Given the possible negative implications of the 24/7 lifestyle for individual health and well-being, one might wonder why people do not massively abstain from the culture of continuous connectivity. Research has introduced concepts that capture the relationship that people have with digital technologies such as smartphones. One such concept is digital well-being, defined by Vanden Abeele (2021) as an experiential state of balance between connectivity and dis-connectivity.

Digital technologies are associated with both benefits and drawbacks. Benefits may relate to enjoyment or entertainment and to self-expression, learning, or practical organization of daily life (Helliwell, 2022; Ling & Lai, 2016; OECD, 2023). Alternatively, people may also experience drawbacks from the use of digital technology: the loss of control over smartphone use and experiences of a waste of time or stress or conflict related to continuous connectivity (Lee et al., 2021; Lee & Hancock, 2024; Vanden Abeele & Nguyen, 2023).

Benefits and drawbacks often co-occur. For instance, mindless scrolling happens because it gratifies hedonic needs, but a significant drawback is that this behavior often conflicts with other goals people wish to achieve (de Segovia Vicente et al., 2023). Similarly, being able to be individually addressable all the time has substantially increased our autonomy (Vanden Abeele et al., 2018), but a drawback of individual addressability is that we experience pressure to be online (Halfmann et al., 2023).

It is because of this ‘connectivity paradox’ (Vanden Abeele, 2021) that the benefits and drawbacks of digital connectivity can best be approached as two separate dimensions. Prior research shows that people report experiencing both benefits and drawbacks. Digital well-being can then be understood as a state in which individuals maximize the benefits of technology use, while minimizing its associated drawbacks. In this study we use the term smartphone well-being, instead of the more general concept digital well-being as introduced by Vanden Abeele (2021). With this concept we want to capture the perceived balance between benefits and drawbacks associated with smartphone use.

2.3. The contribution and research focus of this study

Existing research on smartphone use and well-being reports mixed findings, with both positive and negative associations depending on how smartphone use and well-being are conceptualized (Godard & Holtzman, 2024). These differences are related to variation in measures of smartphone use, outcome variables, and study populations. Therefore, it is important to specify the conceptual choices and contributions that are made in this paper. We adopt a structured approach that distinguishes between smartphone use and smartphone experience in relation to life satisfaction. Smartphone use captures a behavioral engagement, smartphone use experience reflects how this engagement is evaluated, and life satisfaction represents the overall outcome.

Our empirical strategy follows this conceptual distinction. First, the association between smartphone use (disaggregated by purpose and timing) and life satisfaction is examined. Second, smartphone use experience (captured by online vigilance and smartphone well-being) is incorporated to assess how these experiential dimensions are associated with life satisfaction beyond behavioral indicators. Third, interaction terms between smartphone use and smartphone use experience are included to examine whether the association between smartphone use and life satisfaction varies by how smartphone use is experienced. In addition, the study considers heterogeneity across individuals by distinguishing among employed individuals, students, pensioners, and non-active respondents. These groups differ in daily routines and social roles, which may be related to differences in smartphone use and its association with life satisfaction. The analysis further includes individual characteristics such as gender, age, education, and personality traits. The latter responds to the call by [Busch and McCarthy \(2021\)](#), who highlight that most existing research has focused on (problematic) smartphone use among teenagers and university students ([Andersen et al., 2026](#); [Islambouli et al., 2025](#); [Lin & Zhou, 2025](#)).

Within this framework, the study addresses the following research questions.

- RQ1: How are different dimensions of smartphone use associated with life satisfaction?
- RQ2: How are smartphone use experience variables (online vigilance and smartphone well-being) associated with life satisfaction?
- RQ3: To what extent is the association between smartphone use and life satisfaction conditioned by smartphone use experience?
- RQ4: How do these associations vary across socio-economic groups?

3. Data and concepts

3.1. Data

We use self-reported data obtained through the LEVO survey (“Levensomstandigheden in Vlaanderen Onderzocht”) conducted in Flanders, the northern Dutch-speaking part of Belgium.¹ The LEVO survey has been carried out annually since 2010 as a repeated cross-sectional study focusing on subjective well-being and its determinants. Data for the present study were collected in two waves in 2023 (February and September–October) through an online, self-administered questionnaire. The 2023 edition included an additional set of questions related to smartphone use and smartphone use experience. Participation was voluntary, and respondents provided informed consent prior to participation. Respondents were recruited through students enrolled in a course covering research methods. The students collected survey responses while meeting predefined quota criteria aimed at approximating the Flemish population with respect to life situation, educational level, and gender. An ethics waiver for this study was granted by the Ethics Committee of the Faculty of Economics and Business Administration of Ghent University. A total of 2282 respondents met the initial inclusion criteria; after excluding those younger than 18 and those with missing values in the quota variables, the final sample comprised 2259 participants.

Table 1 presents descriptive statistics of the sample, including demographic characteristics and the distribution of respondents’ self-reported socio-economic status. For the empirical analysis, socio-economic status is grouped into four categories: employed individuals, students, pensioners, and non-active respondents. Respondents were also asked to rate themselves on the HEXACO personality traits (Honesty, Emotionality, eXtraversion, Agreeableness, Conscientiousness and Openness to experience). Compared to the Big Five personality framework, the HEXACO model includes an additional dimension of

Table 1

Sample descriptives (N = 2259).

	N	Mean (st dev)/proportion
Male	1123	49.7%
Female	1136	50.3%
Age	2259	46 (18.76)
Lower education	135	6.0%
Lower secondary education	318	14.1%
Higher secondary education	863	38.2%
Bachelor	579	25.6%
Master or more	364	16.1%
Working full-time	972	43.0%
Working part-time	331	14.7%
Student	248	11.0%
Pensioner	393	17.4%
Unemployed	89	3.9%
Not able to work	88	3.9%
Houseman or housewife	137	6.1%

Honesty which relates to personal integrity ([De Vries et al., 2009](#)).

3.2. Concepts

3.2.1. Life satisfaction

In line with [OECD \(2023\)](#) guidelines on measuring subjective well-being, life satisfaction was used as an overall indicator of well-being. The question “All things considered, how satisfied are you with your life in general?” was measured on a scale from 0 ‘very unsatisfied’ to 10 ‘very satisfied’. For our Flemish sample, the average life satisfaction was 7.76 (SD = 1.18), slightly higher than the [OECD, 2023](#) average of 7.3 ([OECD, 2024](#)).

3.2.2. Smartphone use

Smartphone use was measured through self-reported estimates of daily time use, expressed in hours per day. For respondents who are working, smartphone use was reported separately for a typical working day and a typical non-working day. For respondents who are not working, smartphone use was reported for a typical weekday and a typical weekend day. This distinction reflects differences in daily structure and activity patterns. Additionally, a distinction was made between the purposes of the use: communication (e.g., WhatsApp, MS Teams, e-mail) and social media platforms (e.g., Instagram, LinkedIn, Facebook, TikTok, Snapchat, Reddit). **Table 2** shows that working individuals use their smartphones more for communication than non-working individuals, especially on working days. Conversely, the use of social media platforms is higher among non-working individuals.

3.2.3. Online vigilance

To assess online vigilance, we used items developed by [Reinecke et al. \(2018\)](#). From each of the three subdimensions identified by [Reinecke et al. \(2018\)](#)—salience, reactivity, and monitoring—we

Table 2

Smartphone use.

	N	Mean hours per day (st dev)
Communication applications (working day)	1273	2.02 (2.24)
Communication applications (non-working day)	1269	1.61 (1.98)
Communication applications (weekday)	880	1.37 (1.47)
Communication applications (weekend day)	880	1.46 (1.79)
Social media applications (working day)	1273	1.38 (1.88)
Social media applications (non-working day)	1269	1.88 (2.20)
Social media applications (weekday)	880	1.74 (2.08)
Social media applications (weekend day)	880	1.94 (2.22)

¹ Data and code available on request.

selected the two items with the highest factor loadings reported in their exploratory factor analysis, resulting in six items rated on a 5-point Likert scale (1 = does not apply at all, 5 = fully applies).

Factorability of the data was satisfactory ($KMO = .826$; Bartlett's test: $\chi^2(15) = 6709$, $p < .001$). Both the scree plot and a parallel analysis based on a polychoric correlation matrix indicated a clear one-factor solution, with only the first eigenvalue exceeding the simulated eigenvalues. We therefore extracted one factor using maximum likelihood estimation. Table 3 presents the factor loadings of the six items. The internal consistency of the scale was high (Cronbach's $\alpha = .873$). For use in subsequent analyses, factor scores were computed using the regression method, which is recommended for producing scores that closely reflect the underlying latent variable (DiStefano et al., 2009).

3.2.4. Smartphone well-being

To measure smartphone well-being, we used the 'digital well-being scale' developed by Vanden Abeele et al. (2026) and also Vanden Abeele (2021). This scale included three items regarding pleasure and entertainment, three items about functional support and meaningful interactions, three items about loss of control and distraction, and three items concerning problems and conflict related to smartphone use. All items were measured on a 5 point Likert-scale ranging from 1 'almost never' to 5 'very often'.

We conducted an exploratory factor analysis of the scale items. Factorability of the data was very good ($KMO = .892$; Bartlett's test: $\chi^2(66) = 11794$, $p < .001$). Inspection of the scree plot and a parallel analysis both supported retaining two factors. These factors were extracted using maximum likelihood estimation and rotated using an oblimin rotation, as the underlying constructs were expected to be correlated. Indeed, the resulting factor correlation was moderate ($r = .49$). Table 4 presents the pattern-matrix factor loadings for the final two-factor solution. Cronbach's alpha for the items loading on the two factors was .850 and .851, respectively. For use in subsequent regression analyses, factor scores were computed using the regression method.

This two-factor structure - differentiating value (perceived benefits) from discomfort (perceived drawbacks) of smartphone use - is consistent with the validation study by Vanden Abeele et al. (i-an press), which, in a separate sample, also identified a second-order structure distinguishing these two dimensions.

4. Results

Table 5 addresses RQ1 and RQ2 by presenting bivariate correlations between smartphone use (distinguished by type and timing), smartphone use experience (smartphone well-being and online vigilance) and life satisfaction. The results show consistently negative correlations, indicating that increased smartphone use is associated with lower levels of life satisfaction. These negative correlations are more frequent and stronger for social media use than for communication app use. Among employed individuals, communication app use shows no significant association with life satisfaction on either workdays or non-workdays. Regarding smartphone use experience, all three indicators are negatively correlated with life satisfaction, with the strongest associations observed for smartphone discomfort and online vigilance. Somewhat surprisingly, even the value of smartphone use displays a weak negative correlation. Given that correlations among the latent factors were

Table 3
Factor loadings of the online vigilance Items (one-factor solution).

My thoughts often drift to online content	.751
I have a hard time disengaging mentally from online content	.743
When I receive an online message, my thoughts drift there immediately	.703
When I receive an online message, it triggers an impulse in me to check it right away	.653
I constantly monitor what is happening online	.797
I often start certain online applications so I don't miss out on any news	.750

Table 4

Factor loadings of the smartphone well-being items (two-factor oblimin-rotated solution).

	Value	Discomfort
My smartphone is a source of entertainment in my life	.808	.015
My smartphone helps me relieve boredom	.703	.136
I get pleasure from using social media on my smartphone	.821	.076
My smartphone helps me organize my life practically	.458	.036
I get inspiration and meaning from using my smartphone	.632	.032
My smartphone is an essential part of my social life	.695	.032
My smartphone is a source of wasted time	.083	.655
My smartphone distracts me more than I would like	.224	.694
My smartphone makes me less present in the moment	.163	.678
My smartphone is a source of stress	-.153	.714
My smartphone hinders my performance (e.g., at work, at home, in my social relationships)	.050	.766
My smartphone use leads to conflicts	-.006	.528

Table 5

Pearson correlation between use/experience of smartphone and life satisfaction.

		Correlation	p-value
Smartphone use			
Employed	Communication apps workdays	-.022	.426
	Communication apps non-workdays	-.014	.612
	Social apps workdays	-.026	.349
	Social apps non-workdays	-.137	<.001
	Communication apps weekdays	-.092	.006
Students/Pensioners/Non-actives	Communication apps weekend	-.046	.172
	Social apps weekdays	-.208	<.001
	Social apps weekend	-.229	<.001
Smartphone use experience			
All	Smartphone value (SPV)	-.061	.005
	Smartphone discomfort (SPD)	-.128	<.001
	Online vigilance (OV)	-.115	<.001

allowed, this suggests that discomfort is overshadowing the potential positive value of smartphone use.

Table 6 presents the results of three regression models estimated separately for employed individuals, students, pensioners, and non-active individuals, thereby addressing RQ4. Models 1 and 2 correspond to RQ1 and RQ2, respectively, and can be compared with the bivariate correlations presented in Table 5. Model 1 includes smartphone use variables along with control variables (gender, age, educational level, and personality traits), while Model 2 adds smartphone use experience variables. Model 3 introduces interaction terms between smartphone use and experience (RQ3).

For employed individuals, social media use on non-workdays is negatively associated with life satisfaction, consistent with Table 5 and across models. In Model 2, smartphone value is positively associated with life satisfaction, while online vigilance and discomfort are not significant. This contrasts with the bivariate correlations, where all smartphone use experience variables (most strongly discomfort and online vigilance) were negatively related to life satisfaction, and even smartphone value showed a weak negative association. This suggests that these experience variables are closely intertwined with usage patterns and that, once these are accounted for, the positive contribution of smartphone value becomes more apparent. Model 3 identifies only a single (marginally significant) interaction effect, suggesting that smartphone use experience does not substantially condition the relationship between smartphone use and life satisfaction in this group.

Among students, Model 1 shows several significant associations between smartphone use and life satisfaction. Use of communication apps

Table 6
OLS regressions results for life satisfaction.

Y = life satisfaction	Employed			Students			Pensioners			Non-actives		
	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)	(1)	(2)	(3)
Communication apps (weekdays)	-.010	-.009	-.014	-.114 *	-.115 *	-.287 **	-.114	-.171	-.387 **	-.059	-.072	-.036
Communication apps (weekend)	.004	.004	.006	.071	.070	.162	.062	.095	.217 *	.072	.079	.094
Social apps (weekdays)	-.001	-.002	.012	.046	.044	.083	.074	.082	.206	-.111 *	-.122 *	-.200 **
Social apps (weekend)	-.051 ***	-.053 ***	-.058 **	-.112 *	-.112 *	-.083	-.091	-.141	-.275	-.083	-.072	-.043
Smartphone_value (SPV)		.130 **	.156 **		.003	-.235		.101	.519 ***		-.026	-.094
Smartphone_discomfort (SPD)		-.064	-.021		.013	.343		-.182	-.274		-.034	-.080
OnlineVigilance (OV)		-.066	-.259 **		-.004	-.065		.090	-.312 *		.010	.013
SPV x communication apps (weekdays)			-.018			.414 **			-.573 **			.187 *
SPV x communication apps (weekend)			.001			-.179			.348 *			-.043
SPV x social apps (weekdays)			-.012			-.456 **			.081			.119
SPV x social apps (weekend)			.024			.354 **			-.246			-.164
SPD x communication apps (weekdays)			.014			-.052			-.016			-.138
SPD x communication apps (weekend)			.000			-.057			.085			.169 *
SPD x social apps (weekdays)			-.004			.074			.039			.002
SPD x social apps (weekend)			-.029			-.106			-.044			-.007
OV x communication apps (weekdays)			.030			-.210			.436 *			-.088
OV x communication apps (weekend)			.012			.123			-.286			-.036
OV x social apps (weekdays)			.014			.329 **			-.270			.024
OV x social apps (weekend)			.037 *			-.239 **			.462 *			.077
Adj. R ²	.103	.106	.110	.153	.142	.166	.124	.129	.189	.191	.197	.197

Note: *, ** and *** denote significance at the 10%, 5% and 1% level, respectively.

For employed respondents, “weekdays” refer to workdays and “weekends” to non-workdays.

All models control for gender, education, age and personality traits (extraversion, agreeableness, emotionality, conscientiousness, openness to experience, and integrity); coefficients are not reported for brevity.

on weekdays is negatively associated with life satisfaction. In Model 2, smartphone experience variables do not show significant main effects. In Model 3, several significant interaction effects emerge, indicating a moderating role of smartphone use experience. The interaction between smartphone value and communication app use on weekdays is positive, indicating that higher smartphone value attenuates the negative association between communication app use and life satisfaction. For social media use, smartphone value and online vigilance shape the association in opposite ways across weekdays and weekends, indicating that the same type of use can be linked to more positive or more negative outcomes depending on the experiential and temporal context.

For pensioners, Models 1 and 2 show no significant associations between smartphone use or smartphone use experience and life satisfaction. In Model 3, multiple effects emerge, including both main and interaction effects, suggesting that the relationships between smartphone use and life satisfaction depend on smartphone use experience. In particular, the association between communication app use during weekdays and life satisfaction becomes more negative as smartphone value increases.

Among non-active individuals, Model 1 suggests a negative association between social media use during weekdays and life satisfaction. In Model 2, smartphone use experience variables do not show significant main effects. In Model 3, a limited number of effects emerge, suggesting that these relationships may depend to some extent on smartphone use experience. However, these interaction effects are few and relatively weak compared to those observed among students.

Taken together, these results suggest that the associations between smartphone use and life satisfaction vary depending on the type and timing of use (RQ1) and across socio-economic groups (RQ4). The bivariate results indicate consistently negative associations for both

smartphone use and smartphone use experience (RQ2), but the regression analyses show that these associations largely depend on usage patterns and differ across groups. Smartphone use experience generally does not show independent associations with life satisfaction once usage patterns are taken into account, except for smartphone value among employed individuals. Instead, the findings indicate that these experiences may shape the relationship between smartphone use and life satisfaction, primarily through interaction effects (RQ3). These patterns are most pronounced among students, while they are more limited or weaker among employed and non-active individuals.

5. Discussion

The widespread integration of smartphones into everyday life has intensified concerns about their implications for well-being. This study contributes to this debate by examining how smartphone use, smartphone use experience, and their interaction relate to life satisfaction across different socio-economic groups.

First, in line with RQ1, our findings show that the relationship between smartphone use and life satisfaction depends on both the type of use and its timing. Social media use is consistently and negatively associated with life satisfaction, particularly during non-work periods. This aligns with prior research emphasizing the importance of the timing of use (Brodersen et al., 2022; Woo et al., 2021), as well as studies linking excessive or problematic smartphone use to reduced well-being (Brailovskaia et al., 2023; Horwood & Anglim, 2019; Suárez Álvarez & Vicente, 2024). However, unlike Chan (2015), we did not observe significant positive effects of using communication apps. Our results show that social media use has a stronger and more negative impact on life satisfaction than the use of communication apps, aligning with literature

that stresses the importance of the type of use, as seen in Woo et al. (2021), who distinguish between social and non-social use, and Furlan and Meggiolaro (2025), who differentiate between communication and entertainment apps.

Second, addressing RQ2, smartphone use experience (online vigilance and smartphone well-being) is negatively associated with life satisfaction at the bivariate level. This is in line with studies linking online vigilance to lower well-being (Freytag et al., 2021; Johannes et al., 2020; Li et al., 2024; Van Gaeveren et al., 2024), although Johannes et al. (2018) did not find a direct association with life satisfaction. Similarly, the negative association between discomfort and life satisfaction aligns with research on stress and loss of control linked to constant connectivity (Lee et al., 2021; Lee & Hancock, 2024). However, once usage patterns are taken into account, these associations generally disappear, suggesting they are closely intertwined with smartphone use. An exception is found for smartphone value among employed individuals, where a positive association emerges. Overall, this supports the ambivalent nature of digital technologies (Vanden Abeele, 2021), in which positive and negative aspects are closely interrelated.

Third, in line with RQ3, smartphone use experience primarily functions as a moderator rather than a direct predictor. Especially among students and, to some extent, among pensioners, the relationship between smartphone use and life satisfaction depends on how individuals experience their smartphone use. These findings indicate that subjective experiences shape whether smartphone use is associated with more positive or more negative outcomes, rather than exerting independent effects.

Finally, addressing RQ4, we observe substantial heterogeneity across socio-economic groups. The associations are strongest and most complex among students, while they are more limited among employed and non-active individuals. For pensioners, relationships between smartphone use and life satisfaction emerge primarily through interaction effects, indicating that these associations are conditional on smartphone use experience. This aligns with research suggesting higher vulnerability among younger users (Busch & McCarthy, 2021), although contrasting results exist (Suárez-Álvarez & Vicente, 2025). More broadly, these mixed patterns are consistent with meta-analytical and longitudinal evidence stressing context-dependency (Godard & Holtzman, 2024; Schemer et al., 2021; Valkenburg, 2022).

5.1. Implications

This study shows that the association between smartphone use and life satisfaction is not uniform, but varies depending on the type and timing of use, individuals' experiences, and their socio-economic context. While bivariate results suggest uniformly negative associations, the multivariate analyses demonstrate that these relationships depend on usage patterns and are shaped by how smartphone use is experienced. Social media use is more consistently associated with lower life satisfaction than communication app use, while smartphone use experience primarily plays a moderating role.

From a practical perspective, these results suggest that interventions aimed at improving well-being should not focus exclusively on reducing smartphone use. Rather, attention should also be given to how individuals engage with their devices. Encouraging is that more mindful, purposeful, and context-sensitive use may be particularly relevant for groups that appear more vulnerable, such as students. At the same time, the relatively limited associations observed among employed individuals suggest that smartphone use may be less disruptive when embedded in structured daily routines.

5.2. Limitations and further research

In this study, several limitations should be acknowledged. First, in line with OECD guidelines (OECD, 2023), we relied on life satisfaction as our measure of subjective well-being. It is clear that alternative indicators could offer additional perspectives. Second, our operationalisation focused on smartphone use and experience, broader measures that include other digital technologies may be more comprehensively (Vanden Abeele et al., i-an press). Third, our quota sample was limited to Flanders, which may affect representativeness and restrict the generalizability of the findings beyond this region. Alternative sampling procedures and extending data collection beyond Flanders could therefore strengthen external validity. Finally, the cross-sectional design prevents causal inference. Conducting longitudinal research would enable the examination of causal and long-term effects of smartphone use and experience on life satisfaction.

While the limitations above outline opportunities for methodological refinement, the observed differences across socio-economic groups call for further research into underlying mechanisms. Future studies could more closely examine how factors such as everyday roles, obligations, or contextual demands help explain differences between working and non-working individuals. For working people, the work context may shape whether smartphone communication is professional, obligatory, or voluntary, with potentially distinct implications for well-being. Similarly, students may rely on apps for accessing information, study materials, or peer interactions, creating different patterns of use and experience. A more systematic investigation of these contextual dynamics could deepen our understanding of how smartphone use and experience relate to life satisfaction across subgroups.

CRedit authorship contribution statement

Elsy Verhofstadt: Writing – review & editing, Writing – original draft, Supervision, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Luc Van Ootegem:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Conceptualization. **Arthur Jacobs:** Writing – original draft, Methodology, Investigation, Formal analysis, Data curation. **Mariek Vanden Abeele:** Writing – review & editing, Writing – original draft, Methodology, Conceptualization.

Declaration of the use of AI

During the preparation of this work the authors used CoPilot to support the generation of code for supplementary analyses requested by the reviewers, as well as spell-checking. The authors reviewed and edited the content as needed and take full responsibility for the content of the publication.

Funding statement

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Robustness analysis

Table A.1

Structural equation model (SEM) results for life satisfaction

Y = life satisfaction	Pooled	Employed	Students	Pensioners	Non-actives
Communication apps workdays (a1)/weekdays(b1)	-.017	-.009	-.117 **	-.172	-.074
Communication apps non-workdays (a2)/weekend (b2)	.007	.004	.071	.097 *	.082
Social apps workdays (a3)/weekdays(b3)	-.005	-.002	.048	.079	-.122 ***
Social Apps non-workdays (a4)/weekend (b4)	-.068 ***	-.053 ***	-.114 **	-.137	-.070
Dummy female	.015	-.005	.057	-.235	.384 **
Dummy low education	-.158 **	-.145	.328	-.138	-.200
Dummy high education	.174 ***	.160 **	.313 **	-.004	.024
Age	.004 *	.001	.000	.027 **	-.001
Low extraversion (higher score: more reserved)	-.113 ***	-.097 ***	-.118 *	-.125 ***	-.167 ***
Agreeableness	.015	.014	-.029	.080 *	-.029
Emotionality	-.119 ***	-.130 ***	-.097 *	-.085 *	-.080 *
Conscientiousness	-.021	-.040 *	-.119 *	.070	.096 *
Low openness to experience (higher score: less open)	-.013	.019	-.031	-.106 **	-.032
Integrity	.079 ***	.066 **	.250 ***	.049	-.018
Smartphone value (SPV) latent	.121 **	.168 **	-.052	.139	-.069
Smartphone discomfort (SPD) latent	-.046	-.050	.001	-.264	-.028
Online vigilance (OV) latent	-.080	-.131	.010	.110	.033
Adj. R ²	.129	.107	.143	.136	.195

The SEM includes a latent measurement model with two smartphone well-being factors (Value, Discomfort) and one Online Vigilance factor. Standardized factor loadings were strong ($\lambda = .46-.83$), supporting the psychometric structure. The structural model showed a modest fit (RMSEA = .074; SRMR = .109; CFI = .79; TLI = .77), indicating that the model captures key relationships but does not fully account for all variation in the data.

A multi-group CFA (WLSMV) confirmed configural, threshold, and metric invariance across the four groups ($\Delta\text{CFI} = .000$; $\Delta\text{RMSEA} = -.002$), while scalar invariance was not supported. Scalar invariance is not required for our analyses, as our focus is on comparing structural path coefficients rather than latent means.

Appendix B. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.chbr.2026.101172>.

Data availability

Data will be made available on request.

References

- Anders, C., Hofer, M. K., & Chen, F. S. (2024). Directly-measured smartphone screen time predicts well-being and feelings of social connectedness. *Journal of Social and Personal Relationships*, 41(5), 1073–1090. <https://doi.org/10.1177/02654075231158300>
- Andersen, A. I. O., Skogen, J. C., Hjetland, G. J., Finserås, T. R., Bøe, T., Colman, I., & Sivertsen, B. (2026). The relationship between different aspects of social media use and mental health problems and life satisfaction among Norwegian students. *Computers in Human Behavior Reports*, 21, Article 100081. <https://doi.org/10.1016/j.chbr.2025.100881>
- Brailovskaia, J., Truskauskaitė-Kuneviciene, I., Kazlauskas, E., & Margraf, J. (2023). The patterns of problematic social media use (SMU) and their relationship with online flow, life satisfaction, depression, anxiety and stress symptoms in Lithuania and in Germany. *Current Psychology*, 42(5), 3713–3724. <https://doi.org/10.1007/s12144-021-01711-w>
- Brodersen, K., Hammami, N., & Katapally, T. R. (2022). Smartphone use and mental health among youth: It is time to develop smartphone-specific screen time guidelines. *Youth*, 2(1), 23–38. <https://doi.org/10.3390/youth2010003>
- Busch, P. A., & McCarthy, S. (2021). Antecedents and consequences of problematic smartphone use: A systematic literature review of an emerging research area. *Computers in Human Behavior*, 114, Article 106414. <https://doi.org/10.1016/j.chb.2020.106414>
- Cataldo, R., Alaimo, L. S., Grassia, M. G., & Maggino, F. (2024). How subjective well-being evolved over time: Insights from bibliometric and text mining analyses. *Applied Research in Quality of Life*, 19(6), 2389–2415. <https://doi.org/10.1007/s11482-024-10332-x>
- Chan, M. (2015). Mobile phones and the good life: Examining the relationships among mobile use, social capital and subjective well-being. *New Media & Society*, 17(1), 96–113. <https://doi.org/10.1177/1461444813516836>
- de Segovia Vicente, D., Van Gaeveren, K., Murphy, S. L., & Vanden Abeele, M. M. P. (2023). Does mindless scrolling hamper well-being? Combining ESM and log-data to examine the link between mindless scrolling, goal conflict, guilt, and daily well-being. *Journal of Computer-Mediated Communication*, 29(1). <https://doi.org/10.1093/jcmc/zmad056>
- De Vries, R. E., Ashton, M. C., & Lee, K. (2009). De zes belangrijkste persoonlijkheidsdimensies en de HEXACO Persoonlijkheidsvragenlijst. *Gedrag en Organisatie*, 22(3), 232–274. <https://doi.org/10.5117/2009.022.003.004>
- DiStefano, C., Zhu, M., & Mindrila, D. (2009). Understanding and using factor scores: Considerations for the applied researcher. *Practical Assessment, Research and Evaluation*, 14(20). <https://doi.org/10.7275/da8t-4g52>
- Dolan, P., Kudrna, L., & Testoni, S. (2017). “definition and measures of subjective well-being”, measuring wellbeing series, No. 3, what Works centre for Wellbeing. <https://whatworkswellbeing.org/wp-content/uploads/2020/01/SWB-dolan-kudrna-Testoni-NOV17-Centre.pdf>
- Eurostat. (2026). Individuals – Internet use: Mobile phone or smartphone [Data set] https://ec.europa.eu/eurostat/databrowser/view/isoc_ci_dev_i/default/table?lang=en
- Freytag, A., Knop-Huels, K., Meier, A., Reinecke, L., Hefner, D., Klimmt, C., & Vorderer, P. (2021). Permanently online—Always stressed out? The effects of permanent connectedness on stress experiences. *Human Communication Research*, 47(2), 132–165. <https://doi.org/10.1093/hcr/hqaa014>
- Furlan, C., & Meggiolaro, S. (2025). Life satisfaction and internet use in later life in Italy: The role of online activities and living arrangements. *Social Indicators Research*, 177(4), 1007–1025. <https://doi.org/10.1007/s11205-025-03546-5>
- Godard, R., & Holtzman, S. (2024). Are active and passive social media use related to mental health, wellbeing, and social support outcomes? A meta-analysis of 141 studies. *Journal of Computer-Mediated Communication*, 29(1). <https://doi.org/10.1093/jcmc/zmad055>
- große Deters, F., & Schoedel, R. (2024). Keep on scrolling? Using intensive longitudinal smartphone sensing data to assess how everyday smartphone usage behaviors are related to well-being. *Computers in Human Behavior*, 150, Article 107977. <https://doi.org/10.1016/j.chb.2023.107977>
- Halfmann, A., Meier, A., & Reinecke, L. (2023). Trapped between goal conflict and availability norm? How users' mobile messaging behavior during task engagement influences negative self-conscious emotions. *Journal of Media Psychology: Theories, Methods, and Applications*, 36(1), 45–57. <https://doi.org/10.1027/1864-1105/a000381>
- Helliwell, J., et al. (2022). *World happiness report 2022*. New York: Sustainable Development Solutions Network. <https://worldhappiness.report/ed/2022/>
- Horwood, S., & Anglim, J. (2019). Problematic smartphone usage and subjective and psychological well-being. *Computers in Human Behavior*, 97, 44–50. <https://doi.org/10.1016/j.chb.2019.02.028>

- Islambouli, R., Ingram, S., Farah, J. C., Charlesworth, Z., Aouad, R., Delabays, A., Abi Saad, M., & Gillet, D. (2025). Exploring the negative impact of smartphone usage on students' digital wellbeing: A systematic review of empirical studies. *International Journal of Human-Computer Interaction*, 41(24), 15727–15749. <https://doi.org/10.1080/10447318.2025.2499943>
- Johannes, N., Meier, A., Reinecke, L., Ehler, S., Setiawan, D. N., Walasek, N., Dienlin, T., Buijzen, M., & Veling, H. (2020). The relationship between online vigilance and affective well-being in everyday life: Combining smartphone logging with experience sampling. *Media Psychology*, 1–25. <https://doi.org/10.1080/15213269.2020.1768122>
- Johannes, N., Veling, H., Dora, J., Meier, A., Reinecke, L., & Buijzen, M. (2018). Mind-wandering and mindfulness as mediators of the relationship between online vigilance and well-being. *Cyberpsychology, Behavior, and Social Networking*, 21(12), 761–767. <https://doi.org/10.1089/cyber.2018.0373>
- Kushlev, K., & Leita, M. R. (2020). The effects of smartphones on well-being: Theoretical integration and research agenda. *Current Opinion in Psychology*, 36, 77–82. <https://doi.org/10.1016/j.copsyc.2020.05.001>
- Lee, A. Y., & Hancock, J. (2024). Social media mindsets: A new approach to understanding social media use & psychological well-being. *Journal of Computer-Mediated Communication*, 29(1). <https://doi.org/10.1093/jcmc/zmad048>
- Lee, A. Y., Katz, R., & Hancock, J. (2021). The role of subjective construals on reporting and reasoning about social media use. *Social Media + Society*, 7(3). <https://doi.org/10.1177/20563051211035350>
- Li, Q., Guo, Y., Ye, J., Qiu, Y., & Zheng, Y. (2024). I'm trying to get my mind offline: ICT demands, online vigilance, disconnection, and subjective well-being among Chinese media employees. *Current Psychology*, 43(15), 13374–13385. <https://doi.org/10.1007/s12144-023-05390-7>
- Lin, Y., & Zhou, X. (2025). Unravelling the dynamics between smartphone use and psychological well-being: A two-wave panel study. *Behaviour & Information Technology*, 44(16), 3935–3961. <https://doi.org/10.1080/0144929X.2025.2455399>
- Ling, R., & Lai, C.-H. (2016). Microcoordination 2.0: Social coordination in the age of smartphones and messaging apps. *Journal of Communication*, 66(5), 834–856. <https://doi.org/10.1111/jcom.12251>
- OECD. (2019). *How's life in the digital Age?: Opportunities and risks of the digital transformation for people's well-being*. Paris: OECD Publishing. <https://doi.org/10.1787/9789264311800-en>
- OECD. (2023). Subjective well-being measurement: Current practice and new frontiers. *OECD Papers on Well-being and Inequalities*. Working Paper No. 17 https://www.oecd.org/content/dam/oecd/en/publications/reports/2023/09/subjective-well-being-measurement_a9950ae3/4e180f51-en.pdf
- OECD. (2024). *How's life? 2024: Well-being and resilience in times of crisis*. Paris: OECD Publishing. <https://doi.org/10.1787/90ba854a-en>
- Olivos, F., Olivos-Jara, P., & Browne, M. (2021). Asymmetric social comparison and life satisfaction in social networks. *Journal of Happiness Studies*, 22(1), 363–384. <https://doi.org/10.1007/s10902-020-00234-8>
- Oulasvirta, A., Rattenbury, T., Ma, L., & Raita, E. (2012). Habits make smartphone use more pervasive. *Personal and Ubiquitous Computing*, 16(1), 105–114. <https://doi.org/10.1007/s00779-011-0412-2>
- Reinecke, L., Klimmt, C., Meier, A., Reich, S., Hefner, D., Knop-Huelss, K., Rieger, D., & Vorderer, P. (2018). Permanently online and permanently connected: Development and validation of the Online vigilance Scale. *PLoS One*, 13(10), Article e0205384. <https://doi.org/10.1371/journal.pone.0205384>
- Schemer, C., Masur, P. K., Geiß, S., Müller, P., & Schäfer, S. (2021). The impact of internet and social media use on Well-Being: A longitudinal analysis of adolescents across nine years. *Journal of Computer-Mediated Communication*, 26(1), 1–21. <https://doi.org/10.1093/jcmc/zmaa014>
- Statista. (2024). *Average daily time spent on social media worldwide*. retrieved July, 28, 2025 from <https://www.statista.com/statistics/433871/daily-social-media-usage-worldwide/>.
- Suárez Álvarez, A., & Vicente, M. R. (2024). Is too much time on the internet making us less satisfied with life? *Applied Research in Quality of Life*. <https://doi.org/10.1007/s11482-024-10326-9>
- Suárez-Álvarez, A., & Vicente, M. R. (2025). Internet use and the well-being of the elders: A quantitative study in an aged country. *Social Indicators Research*, 176, 1121–1135. <https://doi.org/10.1007/s11205-024-03490-w>
- Valkenburg, P. M. (2022). Social media use and well-being: What we know and what we need to know. *Current Opinion in Psychology*, 45, Article 101294. <https://doi.org/10.1016/j.copsyc.2021.12.006>
- Van Gaeveren, K., Murphy, S. L., De Segovia Vicente, D., & Vanden Abeele, M. M. P. (2024). Connected yet cognitively drained? A mixed-methods Study examining whether online vigilance and availability pressure promote mental fatigue. *Communication Research*. <https://doi.org/10.1177/00936502241248494>
- Vanden Abeele, M. M. P. (2021). Digital wellbeing as a dynamic construct. *Communication Theory*, 31(4), 932–955. <https://doi.org/10.1093/ct/qtac024>
- Vanden Abeele, M. M. P., & Nguyen, M. H. (2023). Digital media as ambiguous goods: Examining the digital well-being experiences and disconnection practices of Belgian adults. *European Journal of Communication*. <https://doi.org/10.1177/02673231231201487>
- Vanden Abeele, S., Saradin Lebedřková, M., Van Gaeveren, K., de Segovia Vicente, D., & Murphy, S. L. (2026). Measuring the benefits and drawbacks of ubiquitous connectivity: The digital well-being Scale. In M. Dennis, & Königs (Eds.), *The future of digital Well-Being: Interdisciplinary perspectives on human flourishing in the Age of artificial intelligence*. Routledge.
- Vanden Abeele, M. M. P., Wolf, R. D., & Ling, R. (2018). Mobile media and social space: How anytime, anyplace connectivity structures everyday life. *Media and Communication*, 6(2), 5–14. <https://doi.org/10.17645/mac.v6i2.1399>
- Woo, K. S., Choi, T. Y., & Kim, J. W. (2021). Mental health, smartphone use type, and screen time among adolescents in South Korea. *Psychology Research and Behavior Management*, 14, 1419–1428. <https://doi.org/10.2147/PRBM.S324235>