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Mind Over Matter: Effects of Digital Devices and Internet Dependence Perceptions and Behavior on Life Satisfaction in Singapore

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Abstract: The ubiquity of digital devices and the Internet, along with continuing technological innovation, makes it difficult not to rely on them in some capacity, whether for work or play, in our daily lives. This dependence on their usage could impact life satisfaction. Furthermore, the recognition and perception of this dependence could have implications for life satisfaction as well, whether positive or negative. We thus sought to explore how perceptions of dependence and dependent behaviour on digital devices and the Internet affected life satisfaction. We also examined whether one had a greater effect than the other. We conducted three online nationally representative surveys with 7991, 7703, and 8356 Singaporeans, and performed a hierarchical linear regression analysis on the data. The results show significant but weak positive relationships between dependence on digital devices, the importance of the Internet, and life satisfaction. A greater consistent effect on life satisfaction was also observed from the perceptions of dependence compared with dependent behavior. The implications are discussed, with implications for governmental policy strategy for reducing the potential harms of dependence on digital devices and the Internet.

Keywords: digital device dependence; Internet importance; life satisfaction; Singapore

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1. Introduction

Global life satisfaction statistics show that across almost 100 countries and 40 years, there has been a generally positive trend of increasing life satisfaction (Haerpfer et al. 2022). Life satisfaction and the factors contributing to it have been an essential topic of study for social scientists for a long time, where it can be defined as "a person's cognitive and affective evaluations of his or her life" (Diener et al. 2009). As a subjective and cognitive judgement, life satisfaction is thus affected by various factors, potentially including the use of technological devices (Lissitsa and Chachashvili-Bolotin 2016).

In today's Industry 4.0 world, digital devices and the Internet have become nigh unavoidable facets of daily life. Globally, there are around 5.4 billion Internet users. A vast majority—96.3%—of users use mobile phones to go online, while 6 in 10 Internet users additionally utilize laptops and desktops (We Are Social & Meltwater 2024). While the extent to which people depend on digital devices and the Internet varies by lifestyle, it is becoming increasingly difficult not to use them in some capacity due to their utility and ubiquity in both work and play. As the prominence of digital devices and the Internet continues to increase year-on-year with technological development, people may increasingly perceive themselves as dependent on them, with potential effects on their subjective life satisfaction.

Previous studies traditionally focused on the socioeconomic factors that contributed to the relationship between digital devices or the Internet and life satisfaction. Another perspective previous studies took was whether the usage of digital devices and the Internet itself contributes to life satisfaction. This study took the novel perspective that psychological

perceptions of dependence on digital devices and the Internet affect one's subjective life satisfaction more than usage behavior in the form of media consumption through the use of digital devices and the Internet.

1.1. Impact of Usage of Digital Devices and the Internet on Life Satisfaction

The literature could be more conclusive on the impact of dependence on digital devices and the Internet on life satisfaction, with most of the extant literature seeming to measure dependence via addiction measures, such as the Internet Addiction Test and its more modern derivatives, such as the IAT-7 (Valenti et al. 2023; Young 1998). In this study, we examined dependence as the importance of usage in a person's life instead of addiction. We also recognize that in developed countries, it may be impossible not to interact with digital devices or the Internet, even if someone does not wish to, simply due to extremely high rates of technological penetration. Singapore is such a society where 99% of households have Internet access, and local smartphone ownership is at 97% (IMDA 2023). Notably, the literature we discuss henceforth, unless specifically mentioned, does not examine problematic Internet and digital device use but rather the adoption of these technologies in general.

Some studies showed that higher usage of Internet and digital devices can be associated with negative life satisfaction (e.g., Lim 2022; Yang et al. 2021; Zhang et al. 2020) and other detrimental effects. For example, a prominent effect is loneliness due to the usage of digital devices and the Internet enabling social isolation, which then contributes toward lower life satisfaction (Stepanikova et al. 2010). More importantly, the usage of digital devices and the Internet can result in problematic or compulsive use, even resulting in withdrawal reactions, such as experiencing negative emotions when Internet use is prevented for whatever reason. This negatively affects psychological well-being and life satisfaction (Muusses et al. 2014; Lachmann et al. 2016).

Despite this, other studies also show associations with higher life satisfaction (e.g., Dienlin et al. 2017; Lissitsa and Chachashvili-Bolotin 2016; Liu and LaRose 2008). Some benefits include the convenience brought about by Internet-mediated activities, such as communicating and building social relationships or communities over long distances; the ability to enhance social and economic mobility; or other positive uses, such as online education, reading online news, coping with social isolation, developing personal and professional interests, using online medical services, or even online physical exercise programs (Dienlin et al. 2017; Khvorostianov et al. 2011; Terzioğlu et al. 2022). Many of these uses thus increase life satisfaction by, for example, increasing social capital through directly or indirectly enhancing social interactions with others (Lissitsa and Chachashvili-Bolotin 2016; Oh et al. 2014).

This difference in findings has generally been explained as the effect of a myriad of mediating or moderating variables, such as peer relationships (Lim 2022), perceptions of social justice (Yang et al. 2021), and perceptions of environmental quality (Zhang et al. 2020). Previous studies also found that specific uses of digital devices and the Internet can cause differences in the effect on life satisfaction, such as habitual online pornography use compared with social networking site use. This is primarily due to the differing emotions generated from different uses, for example, loneliness and depression compared with belonging and support in the above example (Tian et al. 2018).

Thus, while the overall effect of digital devices and the Internet on life satisfaction is unclear or may depend on specific uses, the literature does suggest that digital devices and Internet use can increase life satisfaction but can also lead to problematic use, which has negative effects on wellbeing in general (Dienlin et al. 2017; Huang 2010). Therefore, it can generally be assumed that the use of devices and the Internet will have some effect on life satisfaction, whether positive or negative, and whether it is direct or indirect.

1.2. Perceptions of Dependence on Digital Devices and the Internet

On the other hand, fewer studies examined the impact of perceptions of dependence on digital devices and the Internet. For example, Gao et al. (2022) found that the perceived importance of the Internet positively affects life satisfaction through intermediate variables, such as the family environment defined by the behavior or language of family members. We expected that the perceptions of dependence will still have some effect on subjective experiences of life satisfaction.

In addition, it is essential to examine the perceptions of dependence independent of any actual behavior. There are two reasons for this: First, perceptions may influence and predict subsequent behavior. Thus, any observed behavior would be contingent on preexisting perceptions. Second, perceptions themselves may have a greater direct influence than even perception-influenced behaviors on mental and physical outcomes.

Various frameworks for understanding psychology and behavior demonstrate the importance of attitudes, beliefs, and perceptions due to their ability to influence and shape behavior. For many of these frameworks, attitudes and perceptions are antecedents of behavior. For example, the theory of planned behavior (Ajzen 1991) posits that perceptions of the social acceptability of a particular behavior and the ease of doing these behaviors can affect the intention to and actual performance of those behaviors. Other models, such as the technology acceptance model (Davis 1989), also echo these views, with factors such as perceived usefulness and perceived ease of use contributing to behavioral change.

Furthermore, perceptions may play a more prominent role than behavior in influencing mental and physical health outcomes or other perceptions and attitudes, whether subjective or objective. For example, the well-known placebo effect, where sham treatments are used but presented as genuine, can generate actual changes in physical and mental health due to the complex underlying psychological and neurobiological mechanisms (Munnangi et al. 2023). Other theories also espouse similar views; for example, the learned helplessness theory posits that negative mental health outcomes may result from the perceived absence of control over situations, regardless of whether this is true (Maier and Seligman 1976). Experiments also showed similar results—for example, Glass and Singer (1972) demonstrated that the mere (false) expectation that a button was able to turn off a playback of irritating noise reduced irritation and improved task performance as much as participants who were actually given the ability to turn off the noise. Thus, psychological perceptions may influence outcomes more than actual, objective behavior.

This influential power of perception thus implies that the perception of dependence could impact a person's perception of life satisfaction in ways they may not be consciously aware of. Thus, one's perception of dependence on digital devices and the Internet may influence one's life satisfaction, independent of their usage behavior patterns. Therefore, we posit our first research question:

RQ1: What are the relationships between perceived dependence on the Internet, perceived dependence on digital devices, and life satisfaction and life fulfilment?

We must also consider the actual usage of digital devices and the Internet as a factor that may influence life satisfaction. It may also be possible that actual usage or perceived dependence may have a larger effect on the perceptions of life satisfaction. Thus, we posit our second research question:

RQ2: How important are perceptions of dependence compared with usage behavior in predicting life satisfaction and life fulfilment?

2. Methods

2.1. Samples

We conducted three large-scale online surveys of Singaporeans aged 15 and above in three phases: August 2022, May 2023, and November 2023. The samples were nationally representative by citizenship, gender, age, and race and were recruited through quota sampling from the proprietary Singapore online panel HappyDot.sg. The survey was administered in English and lasted about 15 min. There were 7991, 7703, and 8356 participants

per survey. Participation in the three surveys was sought from respondents prior to the start of the surveys, and they were allowed to discontinue participation at any time. There was minimal risk posed to the respondents, as they were only asked for their views on media consumption habits. The full sociodemographic information of participants can be found in Table 1.

Table 1. Sociodemographic information of respondents.

Variable	Survey 1		Survey 2		Survey 3	
	%	*n*	%	*n*	%	*n*
Gender						
Male	35.1	2803	35.9	2767	36.9	3082
Female	64.9	5188	64.1	4936	63.1	5274
Ethnicity						
Chinese	83.3	6654	84.4	6505	85.1	7113
Malay	9.5	758	8.5	653	7.7	641
Indian	5.1	410	5.1	394	5.3	446
Eurasian	0.3	27	0.4	29	0.3	28
Others	1.8	142	1.6	122	1.5	128
Age						
15–24	13.0	1040	10.6	820	11.2	935
25–34	27.6	2206	26.4	2035	25.3	2116
35–44	23.8	1903	22.9	1766	22.5	1877
45–54	15.6	1244	16.4	1265	17.0	1424
55+	20.0	1598	23.6	1817	24.0	2004

2.2. Measures

2.2.1. Control Variables

Demographic variables that were controlled for included age, gender, and ethnicity.

2.2.2. Social Determinants

Social determinants, such as education and income, were also measured.

2.2.3. Media Consumption (Usage of Digital Devices and Internet)

The usage of digital devices and the Internet was measured via the media consumption habits of various kinds of media. The media platforms examined were television, radio, mainstream news, alternative news, streaming services, and social media. Respondents indicated whether they had used any of these media platforms in the past week (0 = No, 1 = Yes). For media platforms that were not specific to a medium, such as traditional and alternative news, the questions specified that any medium used to access the media platform would count as usage.

For each media platform, the specific platform used was also asked; for example, if one indicated having watched television, a list of common television channels was presented for them to further indicate usage (0 = No, 1 = Yes).

Finally, for each media platform indicated, participants were also asked the duration of their consumption per week, measured in hours and minutes.

2.2.4. Importance of Internet

A single self-reported item asked participants to rate the importance of the Internet to their daily lives (0 = Not important at all, 10 = Extremely important).

2.2.5. Dependence on Digital Devices

A single self-reported item asked participants to rate their perceived dependence on digital devices (0 = I am not hooked on my mobile phone or other digital devices, 10 = I am completely hooked on my mobile phone or other digital devices).

2.2.6. Life Satisfaction

A single self-reported item asked participants to rate their overall satisfaction with their lives nowadays (0 = Not satisfied at all, 10 = Completely satisfied).

The items in 2.2.4 to 2.2.6 were single items because of the necessity of minimizing respondent fatigue due to the extensive number of the preceding media platform questions. This was especially true for respondents who were avid media consumers, who would have had a large number of platforms to recall usage of.

2.3. Data Analysis

A hierarchical regression analysis was conducted on each sample's data to answer the research questions using IBM's SPSS Version 27. Before the analysis, the time in hours and minutes spent on media consumption per media platform was first converted to minutes. Each specific media platform's consumption was then summed together to obtain the final number of minutes of consumption per media platform (e.g., all minutes of television channels' consumption were summed to generate the media consumption of television as a whole).

For each hierarchical regression analysis, the following blocks were entered into the regression model: (1) sociodemographic variables, (2) media consumption variables, and (3) digital device and Internet dependence variables, with life satisfaction as the dependent variable. The standardized beta-coefficient was calculated to determine the extent each variable predicted life satisfaction. The zero-order correlation was also calculated to determine whether multicollinearity existed in the model, which would confound the results if present.

The datasets were not combined, as some respondents would have participated in multiple iterations of the survey. Thus, the datasets were examined separately to prevent skewing the results.

3. Results

Tables 2–4 show the standardized beta coefficients between the independent and dependent variables and coefficient of determination from the regression models of each survey alongside the zero-order correlation coefficients.

Table 2. Survey 1.

Variable	Life Satisfaction	
	Zero-Order Correlation	**Standardized Beta**
Block 1: Demographic and Social Determinants		
Age	0.034 ***	0.075 ***
Gender		
Female	0.048 ***	0.058 ***
Race		
Malay	−0.018	0.009
Indian	−0.028 *	−0.014
Eurasian	−0.003	0.000
Others	−0.026 *	−0.018
Education	0.064 ***	0.005
Income	0.129 ***	0.117 ***
Adjusted R^2 (%)	-	2.4 ***

Table 2. *Cont.*

Variable	Life Satisfaction	
	Zero-Order Correlation	Standardized Beta
Block 2: Media Consumption		
Television	0.034 ***	0.037 **
Radio	−0.028 *	−0.089 ***
Mainstream news	0.011	0.011
Streaming services	0.018	0.007
Alternative news	0.010	0.055 *
Social media	0.005	−0.010
Adjusted R^2 (%)	-	2.9 ***
Incremental R^2 (%)	-	0.60 ***
Block 3: Dependence		
Internet importance	0.183 ***	0.094 ***
Digital device dependence	0.177 ***	0.117 ***
Adjusted R^2 (%)	-	6.0 ***
Incremental R^2 (%)	-	3.1 ***

Notes: N = 7991. Male and Chinese were used as reference categories for gender and race, respectively. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 3. Survey 2.

Variable	Life Satisfaction	
	Zero-Order Correlation	Standardized Beta
Block 1: Demographic and Social Determinants		
Age	0.024 *	0.039 **
Gender		
Female	0.039 **	0.047 ***
Race		
Malay	−0.011	0.014
Indian	−0.028 *	−0.009
Eurasian	−0.007	−0.012
Others	−0.000	0.001
Education	0.063 ***	−0.005
Income	0.120 ***	0.103 ***
Adjusted R^2 (%)	-	1.8 ***
Block 2: Media Consumption		
Television	0.033 **	0.028
Radio	0.036 **	0.012
Mainstream news	0.045 ***	0.021
Streaming services	0.021	−0.008
Alternative news	0.018	0.000
Social media	0.027 *	−0.009
Adjusted R^2 (%)	-	2.1 ***
Incremental R^2 (%)	-	0.30 **
Block 3: Dependence		
Internet importance	0.196 ***	0.131 ***
Digital device dependence	0.171 ***	0.108 ***
Adjusted R^2 (%)	-	6.0 ***
Incremental R^2 (%)	-	4.0 ***

Notes: N = 7703. Male and Chinese were used as reference categories for gender and race, respectively. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 4. Survey 3.

Variable	Life Satisfaction	
	Zero-Order Correlation	Standardized Beta
Block 1: Demographic and Social Determinants		
Age	0.026 *	0.059 ***
Gender		
Female	0.043 ***	0.051 ***
Race		
Malay	−0.028 *	−0.009
Indian	−0.012	0.004
Eurasian	0.005	0.002
Others	0.005	0.005
Education	0.058 ***	0.003
Income	0.112 ***	0.096 ***
Adjusted R^2 (%)	-	1.7 ***
Block 2: Media Consumption		
Television	0.021	0.028 *
Radio	0.005	−0.021
Mainstream news	0.037 **	0.034 *
Streaming services	0.009	−0.007
Alternative news	0.001	−0.008
Social media	0.004	−0.008
Adjusted R^2 (%)	-	1.8 ***
Incremental R^2 (%)	-	0.20 *
Block 3: Dependence		
Internet importance	0.192 ***	0.134 ***
Digital device dependence	0.146 ***	0.091 ***
Adjusted R^2 (%)	-	5.4 ***
Incremental R^2 (%)	-	3.6 ***

Notes: N = 8356. Male and Chinese were used as reference categories for gender and race, respectively. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

The results suggest that there are generally significant but weak positive relationships between the variables regarding the dependence on digital devices, the importance of the Internet, and life satisfaction. In all three surveys, the importance of the Internet ($\beta = 0.094$, $p < 0.001$; $\beta = 0.131$, $p < 0.001$; $\beta = 0.134$, $p < 0.001$) and dependence on digital devices ($\beta = 0.117$, $p < 0.001$; $\beta = 0.108$, $p < 0.001$; $\beta = 0.091$, $p < 0.001$) consistently predicted significantly and positively for life satisfaction. They were also strongly correlated with higher life satisfaction.

It is notable that these two variables were entered in the third block, after the media consumption and demographic variables. Thus, they appeared to predict for life satisfaction over and above the effects of the media consumption and demographic variables. Additionally, the adjusted R^2 of each block of variables was small but significant, implying a significant but weak goodness of fit of the overall model.

There were also some significant but weak relationships between media consumption habits and life satisfaction, but these were not necessarily consistent in direction or magnitude throughout the three surveys. In Survey 1, television and alternative news predicted positively and weakly for life satisfaction ($\beta = 0.037$, $p < 0.01$; $\beta = 0.055$, $p < 0.05$), while radio predicted negatively and weakly for life satisfaction ($\beta = -0.089$, $p < 0.001$). However, in Survey 2, none of the media consumption variables predicted for life satisfaction. In Survey 3, only television and mainstream news predicted positively and weakly for life satisfaction ($\beta = 0.028$, $p < 0.05$; $\beta = 0.034$, $p < 0.05$).

In addition to these, significant but weak relationships were also found for the demographic variables. In all three surveys, age ($\beta = 0.075$, $p < 0.001$; $\beta = 0.039$, $p < 0.01$; $\beta = 0.059$, $p < 0.001$), gender ($\beta = 0.058$, $p < 0.001$; $\beta = 0.047$, $p < 0.001$; $\beta = 0.051$, $p < 0.001$), and income

(β = 0.117, $p < 0.001$; β = 0.103, $p < 0.001$; β = 0.096, $p < 0.001$) predicted positively and weakly for life satisfaction.

4. Discussion

This study had two main objectives: First, to understand the relationship between life satisfaction and perceived dependence on digital devices and the Internet. Second, to compare the importance of perceptions of dependence with the usage behavior of digital devices and the Internet on life satisfaction.

We summarize the contributions of this study into three main findings: First, perceived dependence on digital devices and the Internet predicts positively and weakly for life satisfaction. Next, perceptions of dependence appear to predict life satisfaction better than usage behavior in the context of using digital devices and the Internet. Finally, we found that certain demographic factors were also associated with life satisfaction, with possible explanations related to dependence on digital devices and the Internet.

Answering our first research question, we saw that the dependence measures predicted significantly with a positive relationship for life satisfaction, though weakly. This finding suggests that seeing oneself as dependent on digital devices and the Internet did not necessarily have a detrimental effect on life satisfaction despite the potential typical negative connotations of dependence. This could be because these devices and the Internet are already woven into the fabric of everyday life, and dependence could be seen either as a fact of life or with positivity to its benefits rather than any sort of addictive connotation. With even children growing up with these devices as part of their childhood and early education, it should be no surprise that dependence is viewed positively rather than something to fear (Iivari et al. 2020).

Another possibility is that the potential benefits of usage improve respondents' lives enough to outweigh any detriment to them. For example, as mentioned in the literature review, the usage of digital devices and the Internet could provide benefits, such as social support and community, which would positively impact life satisfaction (Tian et al. 2018). According to frameworks, such as the uses and gratifications theory (Katz et al. 1973), people may also use these devices and the Internet specifically to satisfy needs such as social interaction, entertainment, or information, thereby increasing their life satisfaction. Thus, despite self-admission of dependence on devices and the Internet, respondents may not view it as a problem significant enough to negatively impact their life satisfaction, or even as a problem to begin with.

Furthermore, answering our second research question, the perception of dependence appears to matter more than media consumption habits, which were largely insignificant in predicting for life satisfaction, above and beyond the effects of sociodemographic factors, like income and education. This finding suggests that regardless of how one uses digital devices and the Internet, one's perception of that usage matters more when predicting for life satisfaction. As such, perceptions appear to have a greater direct influence on life satisfaction compared with behaviors, whether those behaviors were influenced by perceptions or not. As mentioned in the literature review, our perception often influences our behavior to the degree that we may not be consciously aware of it. This would also lend strength to the idea that people may not view dependence as something negative since those who perceived themselves as more dependent also perceived themselves to be more satisfied.

One possible explanation for this is a potential conceptual difference between addiction and dependence. While "dependence" is commonly used to refer to the advanced stages of addiction, it also has an alternative meaning as the physiological adaptation to a substance, with withdrawal symptoms when usage ends or is reduced (O'Brien 2011). Dependence is merely a normal reaction to the end of a stimuli, while addiction implies more problematic use (O'Brien 2011). It is thus possible that the respondents may have been "dependent" rather than "addicted", and thus, viewed dependence without negative connotations. Nonetheless, the term has been applied mainly to medical drugs in the literature, and

it remains to be seen whether this model of addiction can be applied to stimuli, such as digital devices.

Finally, though not answering any research question specifically, we also found that certain sociodemographic factors, such as age and income, significantly predicted life satisfaction. In line with other literature, this result could be explained as older respondents having generally higher life satisfaction due to various factors (e.g., Baird et al. 2010; Realo and Dobewall 2011). For those with higher income, it is possible that being more well-resourced financially allowed these respondents to have the financial ability to experience various things that improve life satisfaction.

4.1. Practical Implications

The results of this study could be applied to future campaigns to improve life satisfaction among the population. Since the perceptions of dependence on digital devices and the Internet do not necessarily negatively affect life satisfaction, authorities may continue to promote digital transformation and technologies, as these are viewed positively or as part of life. Of course, the authorities must still consider how this will affect other aspects of life beyond satisfaction.

On the other hand, it may also be prudent for authorities to promote the healthy use of digital devices and the Internet since many still seem to admit dependence, which still has the potential for negative health outcomes. As usage behavior may affect life satisfaction less than perceived dependence, solutions for improving life satisfaction should be targeted toward policies that educate people to be more cognizant and conscious of their usage and hence the extent of dependence rather than policies that outright restrict or limit usage. Given that it would be challenging to limit the usage of digital devices and the Internet, especially if used for work or education, this would allow people to identify problematic, addictive dependence and take steps to mitigate any negative effects.

4.2. Study Limitations and Future Research Considerations

This study used mainly self-reported measures, which could have inaccuracies in respondents' recall of their time spent on the various media consumption platforms and their rating of dependence on digital devices and the importance of the Internet. It is also possible that the respondents might have rated themselves as more highly dependent on these things after recording the time they spent on the various media platforms, as opposed to if they had answered these dependency questions fresh.

Future studies could explore the specific dependencies of digital devices and the Internet that lead to greater life satisfaction, such as work versus leisure usage, and whether there are differences in the perceptions of dependency across the different types of usage. This could lead to insights as to which uses of digital devices and the Internet could potentially be more beneficial or harmful.

Other differences that may be interesting to explore in the future include distinctions between younger and older users, and perhaps even between early adopters of technology compared with later adopters, or those who use a minimal amount of technology in their day-to-day lives. These comparisons would further contribute to the understanding of the perceptions of dependence and usage behavior on life satisfaction through the various demographics' idiosyncrasies.

5. Conclusions

In a world that continues to prioritize and develop technology for work and play, completely preventing the usage of digital devices and the Internet is unrealistic. While some usage is problematic and can and should be managed, most usage is inevitable in daily life. We must continue to monitor the evolving effects of digital devices and Internet usage on well-being. At the same time, we must remember that while both positive and negative effects have been found, the general perception of technology dependence continues to adapt and change along with our evolving world. The power of the mind over matter

should not be underestimated. With careful development of policy and technological solutions, we may be able to mitigate any harmful effects of technology dependence while still reaping the rewards of technological progress.

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References

Ajzen, Icek. 1991. The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes* 50: 179–211. [CrossRef]

Baird, Brandon M., Richard E. Lucas, and M. Brent Donnellan. 2010. Life Satisfaction across the Lifespan: Findings from Two Nationally Representative Panel Studies. *Social Indicators Research* 99: 183–203. [CrossRef] [PubMed]

Davis, Fred D. 1989. Perceived Usefulness, Perceived Ease of Use, and User Acceptance of Information Technology. *MIS Quarterly* 13: 319. [CrossRef]

Diener, Ed, Shigehiro Oishi, and Richard E. Lucas. 2009. Subjective Well-Being: The Science of Happiness and Life Satisfaction. In *The Oxford Handbook of Positive Psychology*. Edited by Shane J. Lopez and C. R. Snyder. Oxford: Oxford University Press, pp. 186–94. [CrossRef]

Dienlin, Tobias, Philipp K. Masur, and Sabine Trepte. 2017. Reinforcement or Displacement? The Reciprocity of FTF, IM, and SNS Communication and Their Effects on Loneliness and Life Satisfaction. *Journal of Computer-Mediated Communication* 22: 71–87. [CrossRef]

Gao, Kai, Mao-Min Jiang, Zheng-Yu Wu, and Pei-Pei Guo. 2022. Influence of Perceived Importance of the Internet on Life Satisfaction and Health of the Older People: An Analysis Based on Intermediary and Moderating Effects. *Frontiers in Public Health* 10: 952619. [CrossRef]

Glass, David C., and Jerome E. Singer. 1972. *Urban Stress: Experiments on Noise and Social Stressors*. New York: Academic Press.

Haerpfer, Christian, Ronald Inglehart, A. Moreno, C. Welzel, Kseniya Kizilova, Jaime Díez-Medrano, M. Lagos, P. Norris, E. Ponarin, Bi Puranen, and et al., eds. 2022. *World Values Survey Trend File (1981–2022) Cross-National Data-Set*. Madrid and Vienna: JD Systems Institute and WVSA Secretariat, Data File Version 3.0.0. [CrossRef]

Huang, Chiungjung. 2010. Internet Use and Psychological Well-Being: A Meta-Analysis. *Cyberpsychology, Behavior, and Social Networking* 13: 241–49. [CrossRef]

Iivari, Netta, Sumita Sharma, and Leena Ventä-Olkkonen. 2020. Digital Transformation of Everyday Life—How Covid-19 Pandemic Transformed the Basic Education of the Young Generation and Why Information Management Research Should Care? *International Journal of Information Management* 55: 102183. [CrossRef] [PubMed]

IMDA. 2023. Singapore Digital Society Report; Infocomm Media Development Authority: 2023. Available online: https://www.imda.gov.sg/about-imda/research-and-statistics/singapore-digital-society-report (accessed on 14 June 2024).

Katz, Elihu, Jay G. Blumler, and Michael Gurevitch. 1973. Uses and Gratifications Research. *Public Opinion Quarterly* 37: 509. [CrossRef]

Khvorostianov, Natalia, Nelly Elias, and Galit Nimrod. 2011. 'Without It I Am Nothing': The Internet in the Lives of Older Immigrants. *New Media & Society* 14: 583–99. [CrossRef]

Lachmann, Bernd, Rayna Sariyska, Christopher Kannen, Andrew Cooper, and Christian Montag. 2016. Life Satisfaction and Problematic Internet Use: Evidence for Gender Specific Effects. *Psychiatry Research* 238: 363–67. [CrossRef] [PubMed]

Lim, Sun Ah. 2022. Relationship between Korean Adolescents' Dependence on Smartphones, Peer Relationships, and Life Satisfaction. *Child & Youth Care Forum* 52: 603–18. [CrossRef]
Lissitsa, Sabina, and Svetlana Chachashvili-Bolotin. 2016. Life Satisfaction in the Internet Age—Changes in the Past Decade. *Computers in Human Behavior* 54: 197–206. [CrossRef]
Liu, Xun, and Robert LaRose. 2008. Does Using the Internet Make People More Satisfied with Their Lives? The Effects of the Internet on College Students' School Life Satisfaction. *CyberPsychology & Behavior* 11: 310–20. [CrossRef]
Maier, Steven F., and Martin E. Seligman. 1976. Learned Helplessness: Theory and Evidence. *Journal of Experimental Psychology: General* 105: 3–46. [CrossRef]
Munnangi, Swapna, Joshua Henrina Sundjaja, Karampal Singh, Anterpreet Dua, and Lambros D. Angus. 2023. Placebo Effect. In *StatPearls*; Treasure Island: StatPearls Publishing. Available online: https://www.ncbi.nlm.nih.gov/books/NBK513296/ (accessed on 13 November 2023).
Muusses, Linda D., Catrin Finkenauer, Peter Kerkhof, and Cherrie Joy Billedo. 2014. A Longitudinal Study of the Association between Compulsive Internet Use and Wellbeing. *Computers in Human Behavior* 36: 21–28. [CrossRef]
O'Brien, Charles. 2011. Addiction and Dependence in DSM-V. *Addiction* 106: 866–67. [CrossRef]
Oh, Hyun Jung, Elif Ozkaya, and Robert LaRose. 2014. How Does Online Social Networking Enhance Life Satisfaction? The Relationships among Online Supportive Interaction, Affect, Perceived Social Support, Sense of Community, and Life Satisfaction. *Computers in Human Behavior* 30: 69–78. [CrossRef]
Realo, Anu, and Henrik Dobewall. 2011. Does Life Satisfaction Change with Age? A Comparison of Estonia, Finland, Latvia, and Sweden. *Journal of Research in Personality* 45: 297–308. [CrossRef]
Stepanikova, Irena, Norman H. Nie, and Xiaobin He. 2010. Time on the Internet at Home, Loneliness, and Life Satisfaction: Evidence from Panel Time-Diary Data. *Computers in Human Behavior* 26: 329–38. [CrossRef]
Terzioğlu, Zeynep Ayça, S. Gülfem Çakır-Çelebi, and Mustafa Yıldız. 2022. Effect of Online Mindfulness-Based Physical Exercise Program on Psychological Well-Being and Life Satisfaction during the COVID-19 Pandemic. *Current Psychology* 43: 15035–45. [CrossRef]
Tian, Yu, Shujie Zhang, Rui Wu, Peng Wang, Fengqiang Gao, and Yingmin Chen. 2018. Association between Specific Internet Activities and Life Satisfaction: The Mediating Effects of Loneliness and Depression. *Frontiers in Psychology* 9: 1181. [CrossRef]
Valenti, Giusy D., Giuseppe Craparo, and Palmira Faraci. 2023. The Development of a Short Version of the Internet Addiction Test: The IAT-7. *International Journal of Mental Health and Addiction*. [CrossRef]
We Are Social & Meltwater. 2024. Digital 2024 April Global Statshot Report—Datareportal—Global Digital Insights; DataReportal. Available online: https://datareportal.com/reports/digital-2024-april-global-statshot (accessed on 14 June 2024).
Yang, Hua-Lei, Yuan-Yang Wu, Xue-Yu Lin, Lin Xie, Shuo Zhang, Si-qing Zhang, Shi-ming Ti, and Xiao-dong Zheng. 2021. Internet Use, Life Satisfaction, and Subjective Well-Being among the Elderly: Evidence from 2017 China General Social Survey. *Frontiers in Public Health* 9: 677643. [CrossRef]
Young, Kimberly S. 1998. Internet Addiction: The Emergence of a New Clinical Disorder. *CyberPsychology & Behavior* 1: 237–44. [CrossRef]
Zhang, Jiaping, Mingwang Cheng, and Ning Yu. 2020. Internet Use and Lower Life Satisfaction: The Mediating Effect of Environmental Quality Perception. *Ecological Economics* 176: 106725. [CrossRef]

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