Development and Validation of Digital Minimalism Scale

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Abstract

Digital minimalism refers to the intentional curation of digital tools and online activities in order to improve focus, productivity, and overall well-being. The current study consisted of two studies that aimed to construct a psychometrically valid measure of digital minimalism. Based on the literature analysis and four focus groups with psychologists and common adolescents, an initial item pool of 20 items was produced for study I. After reviewing this item pool, a group of psychologists came up with a preliminary draft of the digital minimalism that contained a total of 14 questions. It was administered to a group of Pakistani adolescents (N = 346). By exploratory component analysis, the results suggested the presence of two factor structures. Factor loadings ranging from.59 to.76 of the digital minimalism scale use that explained 47% of the variation. Digital intent (5 items), and Digital Declutter (4 items) were the two factors. All factors were correlated with one another with good alpha reliability (α >.71). In the second study, the factorial structure was duplicated with the use of a confirmatory factor analysis, and its construct validity was examined in an independent sample consisting of 678 Pakistani adolescents. A good correlation existed between a digital minimalism and life satisfaction. In general, the findings demonstrated that Digital minimalism scale is a psychometrically sound measure that ought to be investigated further among adolescents all over the world.

Introduction

Digital technology and social media platforms have become ubiquitous in the modern era, transforming how people communicate, access information, and use various resources (Smith & Anderson, 2019). However, the constant integration of digital devices into daily life and the uninterrupted connectivity they offer have also raised concerns about their potential impact on mental health, productivity, and life satisfaction (Rosen et al., 2014). In response to these challenges, a movement called "digital minimalism" has emerged, which advocates for a mindful and intentional use of technology (Newport, 2019).

Digital minimalism is the practice of selectively choosing digital tools and online activities that enhance one's focus, productivity, and well-being, while minimizing unnecessary digital distractions, reclaiming time for meaningful pursuits, and fostering stronger relationships with the physical world and face-to-face interactions (Mogendorff & Van Deursen, 2019). As digital minimalism gains popularity, researchers have started to explore its various dimensions and benefits for both individuals and society. It is crucial to understand how digital minimalism is adopted, implemented, and experienced, as well as its implications for well-being and social

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connectedness in a society that is increasingly dependent on digital technologies (Mogendorff & Van Deursen, 2019).

The aim of this study is to investigate the phenomenon of digital minimalism and its potential effect on psychological well-being, with a special focus on the millennial generation. Millennials, as the natives of the digital age, play a key role in driving the ongoing digital transformation. As a result, they are exposed to both the advantages and disadvantages of technology overuse (Kenny & Hattersley, 2021). Therefore, a comprehensive examination of how millennials embrace and practice digital minimalism could provide valuable insights into its effectiveness as a coping mechanism and a lifestyle choice in the current digital era

Despite the growing popularity and relevance of digital minimalism, there is a lack of empirical research and measurement tools to assess the extent and impact of this phenomenon. Therefore, the aim of this research is to develop and validate a scale that can measure the level of digital minimalism among individuals, as well as its relationship with various psychological a outcomes

Purpose

The goal of the present study was to develop a digital minimalism scale that is reliable from a psychometric standpoint and takes into account multiple dimensions. According with relevant literature, the current study hypothesized that digital minimalism will positively correlate with life satisfaction and happiness.

Materials and Method

Using focus groups discussion, the researchers initially identified construct of digital minimalism. The Millennial were asked to provide specific examples of digital minimalism. The available literature on digital minimalism, as well as the records of interviews and focus group discussions, were evaluated, and 16 initial items were developed. These 16 items were then reviewed by a committee for appropriateness of content, and resulted in 14 items. After which the questionnaire was finalized and distributed.

Sample

Two separate samples of millennials were tested with the scale. The two samples were solicited from universities in the both the public and private sectors. Sample I ($N = 346$) was recruited from three public and private universities in Punjab, whereas Sample II ($N = 678$) was recruited from several public and private institutions in Punjab. The millennials were approached personally in their universities. Their ages ranged from 25 to 40 years, with an average age of 29.05 and a standard deviation of 2.30.

Instruments

Life satisfaction scale and happiness were utilized with the newly designed measure to confirm convergent validity. The following is a brief description of the scale:

Satisfaction with Life Scale (SWLS) (Hayat et al., 2016). In this study, the Satisfaction with Life Scale (SWLS) in Urdu was used. This scale has total 5 items with no negative item. Each of item was scored on 5-point Likert scale (5= Strongly agree; 1= Strongly disagree). The Cronbach alpha reliability of the scale is .83 for the original scale (Diener, Emmons, Larsen, Griffin, 1985).

Happiness Scale (Lyubomirsky & Lepper, 1999). In this study, Urdu translation of happiness scale consisted on 4 item was used to measure happiness. Each of item is scored on 7-point Likert scale (7= happy person; 1= unhappy person). Item no 4 was reverse coded. The alpha reliability of scale is .90.

Procedure

After conducting a qualitative analysis to determine the initial factor structure and doing a search of the relevant literature, the researchers conceptualized the digital minimalism mindset. After that, the millennials were approached to find out the positions that they take, especially on digital minimalism. After the gathering the data of millennials' committee was convened to discuss the data. After answering all of the questions for the four subscales, the questionnaire completed two additional stages of development, namely Exploratory Factor Analysis and Confirmatory Factor Analysis, before it was considered complete. The following section provides an overview of the details of the first two stages:

Results

An inquiry into the preliminary factor structure of the revised scale was supposed to be carried out with the help of this particular phase of the study research. In order to determine the factor structure of the scale, an exploratory factor analysis was carried out. With the assistance of exploratory factor analysis, the utilization of social media was disassembled into its component pieces. The approach of highest likelihood, along with direct oblimin rotation, was utilized in order to conduct the analysis of the scale's factor structure.

Table 1: Measuring Sample Adequacy for Digital Minimalism Scale (N=346*).*

	KMO	Bartlet Test of Sphericity		
		Chi- square	df	sig
Digital minimalism mindset scale	.78	510.39	36	.000

The adequacy of the sample was assessed using Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity. As per Pallant (2013), a KMO value of 0.6 or higher is considered adequate for sample adequacy. Additionally, if the significance value in Bartlett's Test of Sphericity is less than 0.001, it indicates that the data does not follow an identity matrix, suggesting almost multivariate normality and suitability for further analysis. In this study, the test results indicated high sample adequacy.
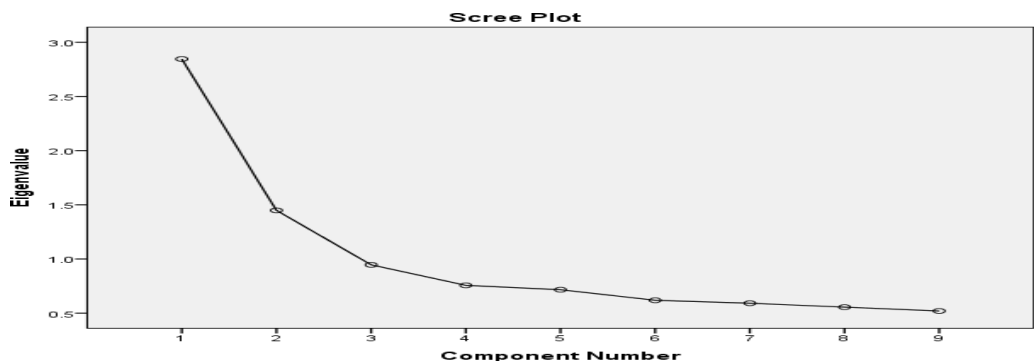

Figure 1. Scree Plot for Factor Analysis of Digital Minimalism Scale.

Figure 1 displays the eigenvalues of each factor extracted from the data, plotted against the factor numbers. It suggests to retain two where the eigenvalues sharply decrease after two factors.

Table 2. Exploratory Factor Analyses Digital Minimalism Scale.

Sr. #	Items	Factor 1	Factor 2
		Digital Intent (Items=5)	Digital Declutter (Items=4)
1	DM3	.701	.067
2	DM4	.618	.145
3	DM7	.640	.166
4	DM8	.760	-.026
5	DM10	.606	.255
6	DM2	.137	.598
7	DM11	.048	.755
8	DM12	.189	.672
9	DM13	.085	.710
	Eigen Value	2	1
	% Variance	31	16
	Cum. %	31	47

Table 2 showed that items Item no. 3, 4, 7, 8, and 10 load on digital intent. Item no. 2, 11, 12 and 13 loaded on digital declutter. Overall, the results showed that the digital minimalism scale was a valid and reliable measure.

Table 3: Correlation of the Subscales and Total Scale of Digital Minimalism.

Variables	K	M	SD	α	1	2	3
Digital Intent	5	15.96	3.74	.70	-	.72***	.85***
Digital Declutter	4	13.84	3.08	.71	-	-	.77***
Digital Minimalism	9	29.80	5.54	.70	-	-	-

***$p < .001$,

The correlation matrix, mean, and standard deviation of all of the digital minimalism scale is presented in Table 3. The findings suggest that every variable has a positive correlation, which suggests that the variables are connected in some way while remaining distinct. In addition, there is a significant positive link between each factor and the overall scale. There is acceptable level of internal consistency as evidenced by the fact that all factor and total scale.

Table 4: Item-total Correlation of Digital Minimalism Scale.

Items	R
3	.551*
4	.535*
7	.581*
8	535*
10	.601*
2	.503*
11	.546*
12	.563*
13	.527*

*$p<.05$.

Table 4 indicates that 9 items of digital minimalism scale have positive correlation ranging from (.50) to (.60) with total scores of this scale.

Confirmatory Factor Analysis (CFA) of Digital Minimalism Scale

Evaluation of the factorial structure of the Digital Minimalism Scale was conducted through CFA. Fit indices for this scale are presented in Table 12, while Table 13 showcases the standardized factor loadings for the same scale.

Table 5: Stepwise Model fit for CFA of Digital Minimalism Scale for Millennials.

Models	χ^2	Df	Fit indices			
			GFI	CFI	IFI	RMSEA
Model	78.97*	26	.92	.90	.90	.050

*$p < .001$.

Table 5 presents the stepwise model fit indices computed for the confirmatory factor analysis of the digital minimalism scale. This analysis aimed to assess the correlation between the scale's dimensions. An initial measurement model of the Scale, consisting of 9 indicators, was estimated through CFA of the first order. The CMIN/DF ratio, which was less than 5, aligns with the recommendation by Marsh and Hocevar (1985) that the ratio should not exceed 5 for model acceptance. The Goodness of Fit Index (GFI) value of 0.92 met the criterion of 0.90 or greater (Hooper et al., 2008). Additionally, CMIN/DF was 3.03, and all other model fit indices were 0.90 or higher (CFI = 0.90, IFI = 0.91). Similarly, the scale's effectiveness was confirmed by a Comparative Fit Index (CFI) value of 0.90. Literature suggests that an RMSEA value of 0.050, which is less than 0.08, indicates reasonable model data (Rigdon, 1996). Furthermore, other model fit indices indicated a substantial degree of congruence between the data and the model, with all four fit indices exceeding 0.9. The final scale retained a total of 9 items.

Table 6: Standardized Factor Loading of Confirmatory Factor Analyses for Digital Minimalism Scale.

Sr. #	Items	Factor 1 Digital Intent (Items=5)	Factor 2 Digital Declutter (Items=4)
1	DM3	.54	
2	DM4	.47	
3	DM7	.58	
4	DM8	.55	
5	DM10	.55	
6	DM2		.49
7	DM11		.63
8	DM12		.57
9	DM13		.54

The standardized factor loadings for all indicators of both factors exceeded .45, indicating that each factor of the Digital Minimalism scale made a distinct contribution to operationalizing this construct. The final model comprises 9 items and demonstrates a good fit to the data.
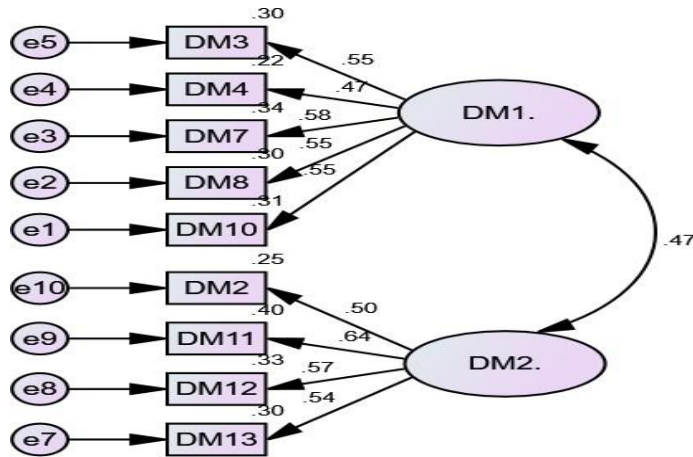
Figure 2: Standardized Factor Loadings in CFA of Digital Minimalism Scale.

Establishment of Psychometric Properties of Digital Minimalism Scale

Table 7: Correlation Matrix of Digital Minimalism, its Subscales with Life Satisfaction and Happiness.

	Variables	**M**	**SD**	**1**	**2**	**3**	**4**	**5**
1.	Digital Intent	15.96	3.74	-				
2.	Digital Declutter	13.84	3.08	31***	-			
3.	Digital Minimalism (total)	29.80	5.54	.84***	.76***	-		
4.	Life Satisfaction	15.98	3.34	.30***	.13***	.28***	-	
5.	Happiness	20.36	5.18	135***	.13*	11**	.24***	-

$^{***}p < .001.$ $^{**}p < .01.$ $^{*}p < .05.$

Table 7 shows correlations of digital minimalism scale, its subscales with life satisfaction and happiness. Findings revealed that constructs have significant positive correlation with each other and their respective subscales.

Discussion

Based on EFA, 7 out of 16 items from the Digital Minimalism Scale (DMS) were removed due to low factor loadings or cross-loading. The remaining 9 items demonstrated high communalities and resulted in a 2-factor solution that was conceptually sound, cohesive, and easily understandable. This solution accounted for a cumulative variance of 47%. The factor loading ranged between .59 and .76. The factors included digital intent and digital declutter. Overall, the results indicate the factorial structure of DMS was reliable and valid.

Digital minimalism is a conceptual framework about the utilization of technology, which promotes a deliberate and discerning approach to engaging in online activities. The underlying

assumption of this perspective is that the impact of digital tools and platforms varies, with some being more advantageous or detrimental than others.

The first factor, digital intent includes 5 items. It encompasses the deliberate and purpose-driven utilization of digital technologies. The foundation of this construct is deeply grounded in the fundamental principles of digital minimalism as eloquently expounded upon by Newport (2019). The process entails the deliberate choice of applications and websites that are in accordance with one's individual objectives and principles, thus fostering a mindful approach to one's digital interactions.

The second factor consist on 4 items, known as Digital Declutter, derives its inspiration from the principles of decluttering observed in the physical realm (Kondo, 2014). In the monarchy of the digital site, the focus lies on the endeavor to minimize the presence of superfluous digital elements, such as clutter, distractions, and non-essential digital possessions. The process of creating items for this particular factor facilitates a consistent practice of evaluating and discarding digital apps or items that have lost their significance, thereby promoting the organization and tidiness of one's digital environment. The concept being discussed holds particular relevance in a contemporary society where digital distractions are abundant, and individuals find themselves overwhelmed by the constant influx of digital stimuli.

The study examined the relationships between digital minimalism and various scales, such as Happiness, Life satisfaction, social comparison, and wellbeing, to establish convergent validity. It was hypothesized that digital minimalism would be positively correlated with the positive constructs examined in the study, while being negatively correlated with the negative scales. The hypothesis is supported by the results, which indicate a significant positive relationship between digital minimalism and positive constructs, as well as a significant negative relationship with social comparison. The results support the convergent validity of the digital minimalism scale. This supports the convergent validity of the DMS. The results indicated satisfactory internal consistency, with alpha coefficients of DMS and its subscales (digital intent and digital declutter) being $\geq .70$. The factorial structure of the DMS demonstrates its validity. The high magnitude of alpha indicates the presence of internally consistent scales and subscales. The observed pattern of relationship, aligning with expectations, provides support for the convergent validity. The available evidence supports the construct validity of the scale.

The validation process of the Digital Minimalism Scale played a crucial role in the overall research endeavor. The scale exhibited strong psychometric properties, as evidenced by its favorable fit indices in both exploratory and confirmatory factor analysis. The observed internal consistency of both the Digital Intent and Digital Declutter factors exhibited a commendable level of reliability, suggesting that the items comprising the scale effectively assess the underlying constructs they were specifically intended to evaluate. In addition, it is worth noting that concurrent validity was effectively established through the process of correlating the scale with pre-existing measures that are directly associated with technology usage and overall well-being. This particular analysis yielded compelling evidence, indicating that individuals who obtained higher scores on the digital minimalism scale also reported experiencing higher levels of life satisfaction.

Implications

The concept of digital minimalism entails a philosophical approach aimed at prompting individuals to critically evaluate the digital tools and behaviors they engage in, with the objective

of identifying those that provide the greatest value and subsequently optimizing their utilization. The underlying motivation for this perspective stems from the conviction that eliminating superfluous digital distractions and prioritizing essential tools can yield substantial enhancements in one's overall quality of life. The concept of digital minimalism does not advocate for a complete disconnection from all forms of technology. Rather, it emphasizes the selective engagement with technology that holds the utmost significance in an individual's life.

In the context of Pakistan, there has been a noticeable surge in the inclination towards digital minimalism among various segments of the population, particularly the youth and educated cohorts. Nevertheless, it is worth noting that there exists a dearth of empirical investigations pertaining to the concept under consideration, as well as its measurement, specifically within the context of Pakistan. The reliability, validity, and factor structure of the scale were assessed through an empirical investigation involving a sample of internet users from Pakistan. The findings of this research endeavor will make a valuable addition to the existing body of knowledge on the subject of digital minimalism. Moreover, it will offer a practical resource for scholars and professionals engaged in the investigation and advocacy of digital minimalism within the context of Pakistan.

Conclusion

The purpose of the study was to design a reliable and valid instrument for measuring the digital minimalism among Pakistani millennials. In terms of validity, reliability, and factorial structure, the results imply that the created instrument is psychometrically accurate. The study concluded that digital minimalism scale comprises two factors: Digital intent and Digital declutter. Each of these factors is associated with life satisfaction and happiness. The findings of this study emphasize the necessity of being aware of one's intentions for using social media and using it in a way that fosters positive social connections and well-being.

Limitations

Despite the fact that the developed instrument exhibited strong psychometric qualities, the study sample size was small. Further research with larger sample numbers may further validate the findings of the instrument. In addition, the research was limited to millennials in Pakistan, and the findings may not apply to other demographics or cultures. In addition, the dependence of the study on self-reported measures may have created bias, since participants may have offered socially desired responses.

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