

Investigating Addiction to Social Media Use: Influential Factors and Mitigation Strategies

by Layla Boroon

A thesis submitted in fulfilment of the requirements
for the degree of

Doctor of Philosophy (Information Systems)

Under the supervision of

Principal Supervisor: Professor Olivera Marjanovic

Co-Supervisor: A/Prof Babak Abedin

Co-Supervisor: Dr Eila Erfani

University of Technology Sydney

Faculty of Engineering & Information Technology

December 2022

Certificate of Original Authorship

I, Layla Boroon declare that this thesis is submitted in fulfilment of the requirements for the award of Doctor of Philosophy in Information System, in the School of Professional Practice and Leadership/Faculty of Engineering and Information Technology (FEIT) at University of Technology Sydney.

This thesis is wholly my own work unless otherwise referenced or acknowledged. In addition, I certify that all information sources and literature used are indicated in the thesis.

Signature:

Production Note:
Signature removed prior to publication.

December 2022

This thesis was formed in a conventional format.

This thesis is an unpublished, independent work and original intellectual product of the author, L. Boroon.

Dedication

To my love, Mohammad Kazem whom I am proud of him for his generosity, supports, passion, kindness, patience and encouragement that let my dreams come true.

And

To my dearest son Soheil who has made my life more amazing, enjoyable, and meaningful.

ACKNOWLEDGEMENT

I would first like to express my sincere gratitude to my principal supervisor Prof. Olivera Marjanovic, my co-supervisors A/Prof. Babak Abedin and Dr. Eila Erfani, for their continuous support of my Ph.D. in Information System thesis and for their patience, motivation, enthusiasm and guidance during this vicissitudinous journey. I would like to specially thank my principal supervisor, Prof. Olivera Marjanovic for accepting my request to be my principal supervisor, and supporting me in a critical and stressful stage of my life. I do appreciate her beautiful mind and manner for holding my hand when I needed her and encouraging me to believe in myself. I could not have asked for a better mentor and supervisor for my Ph.D. study. I am thankful for her selfless dedication in giving her time, ideas, countless e-mails to make my Ph.D. journey an engaging one. I admire her remarkable patience and commitment to supervision and support.

I would also like to thank the Ph.D. candidates and UTS academic staff who were involved in the validation survey for this research. Without their passionate participation and input, the validation survey could not have been successfully conducted.

Last, but not at least, I greatly appreciate my loving and caring husband and son Mohammad Kazem and Soheil for all their steadfast love and support, encouragement and patience.

Thank you all.

List of papers/Publications

1. BOROON, L., ABEDIN, B. & ERFANI, S. Addiction to Social Network Site Use: An Information Technology Identity Perspective. Australasian Conference on Information Systems, 2019.
2. Social media addiction: A systematic literature review (drafted journal paper)
3. Using Artificial Intelligence to Change the Future of IT Addiction Treatment (drafted journal paper)
4. Social media addiction: Influential factors and mitigation strategy (drafted journal paper)

Contents

List of Figures	11
List of Tables	11
Abstract	13
Chapter 1: Introduction	15
1.1. Overview	15
1.2. Overview of the Scope of the Research	15
1.3. Research Objectives and Significance	20
1.4. Research Questions	23
1.5. Research Model and Research Design	24
1.6. Key Findings and Contributions	25
1.7. Definition of Key Terms	28
Chapter 2: Literature Review (Research Background)	31
2.1. Overview	31
2.2. Information Technology Addiction	31
2.3. Addiction to Social Media Use	33
2.3.1. History of Social Media	33
2.3.2. Social media in the Information Systems Literature	35
2.3.3. Addiction to Social Media Use	40
2.4. Gaps in the Literature	43
Chapter 3: Theoretical Background, Research Model and Hypotheses	48
3.1. Overview	48
3.2. Theoretical Background	48
3.2.1. IT Identity as a Part of Self-identity or Self-Concept	48
3.2.2. Dual Systems Model of Self-related Behaviours	52
3.2.3. Social Cognitive Theory (SCT) of Self-Regulation	54
3.3. Research Model and Hypotheses	57
3.3.1. Reflective System (attitude, social norms and personal norms) Influencing IT/Social Media Identity	57
3.3.2. Reflexive System (habit) Influencing IT/Social Media Identity	60
3.3.3. IT/Social Media Identity Influencing Social Media Addiction	61
3.3.4. Self-regulation as a Mitigation Strategy and Moderator	62
Chapter 4: Research Design and epistemology	64

4.1. Overview	64
4.2. Phase I: Systematic Literature Review (SLR)	67
4.2.1. Eligibility Criteria	68
4.2.2. Search Strategy	70
4.2.3. Study Selection and Quality Assessment/Assessment of Risk Bias	72
4.2.4. Data Analysis and Synthesis	74
4.3. Phase II: Quantitative Research (Online Survey)	75
4.3.1. Participants/Samples	75
4.3.2. Measurements and Data Collection Procedure	77
4.3.3. Data Analysis.....	81
4.4. Phase III: Qualitative Research (Interview)	88
4.4.1. Participants	89
4.4.2. Measurements and Data Collection.....	89
4.4.3. Data Analysis.....	91
4.5. Consideration of Ethics and Risks	95
Chapter 5: Findings of Systematic Literature Review (SLR)	97
5.1. Overview	97
5.2. Selected Studies	98
5.3. Studies' Demographics	106
5.4. Characteristics of Social Media Addiction	122
5.5. Mitigation Strategies	136
Chapter 6: Findings of Quantitative Data Analysis	141
6.1. Overview	141
6.2. Preliminary analysis	141
6.2.1. Missing Values	141
6.2.2. Sample Size	142
6.2.3. Descriptive Statistics	143
6.2.4. Assessment of Normality of Data Distributions	144
6.3. Factor Analysis	145
6.3.1. Standard Deviation (SD).....	146
6.3.2. Communalities or R square (R ²)	147
6.3.3. KMO and Bartlett's Test	148
6.3.4. Total Variance Explained.....	149

6.3.5. Rotated Component Matrix	150
6.4. Measurement Model Analysis	153
6.4.1. Reliability	153
6.4.2. Validity	157
6.5. Structural Model Analysis	170
6.5.1. Predictive Capabilities of the Model	170
6.5.2. Hypotheses Testing	174
Chapter 7: Findings of Qualitative Data Analysis	189
7.1. Overview.....	189
7.2. Interviews	189
7.2.1. Demographic of the Interviewees	190
7.2.2. Data Collection	191
7.3. Thematic Analysis.....	191
7.3.1. Familiarising with Collected Data	191
7.3.2. Generating initial codes	192
7.3.3. Identifying, Reviewing and Naming Themes	194
7.3.4. Results	196
Chapter 8: Discussion	204
8.1. Overview.....	204
8.2. Theoretical Contributions	205
8.2.1. SLR Findings	205
8.2.2. Quantitative Research (Online Survey)	208
8.2.3. Qualitative Research (Interviews)	214
8.3. Practical Contributions (Implications).....	216
Chapter 9: Future Research, Limitation and Conclusion	220
9.1. Overview.....	220
9.2. Future Research Resulted from the Limitation	220
9.3. Conclusion	223
References.....	225
Appendix	246
Appendix 1: Criteria for the Quality Assessment	246
Appendix 2: Quality Assessment of the Selected Papers for SLR	247
Appendix 3: Identified Influential Factors/Drivers of Social Media Addiction	252

Appendix 4: Invitation to Assess the Content Validity of the Online Survey	283
Appendix 5: Online Survey Questionnaires	284
Appendix 6: Invitation to Participate in the Online Survey Research.....	292
Appendix 7: Online Survey Consent Form	293
Appendix 8: Interview Questionnaire.....	295
Appendix 9: Invitation to Participate in the Interview Research	297
Appendix 10: Interview Consent Form.....	298
Appendix 11: Normality Test Outcome	301
Appendix 12: Overall Structural Model with Factor Loadings (SMARTPLS 3).....	305
Appendix 13: Overall Structural Model of t-values (SMARTPLS 3).....	306
Appendix 14: Structural Model Analysis (Hypotheses Test).....	307
Appendix 15: Identified Codes, Categories, Sub-theme and Themes from Data Analysis	312
Appendix 16: Meaning unit, Condensed meaning unit, Code and Category	316

List of Figures

Figure 1-1. An overview of the scope of this research.....	19
Figure 2-1. Most popular social media platforms worldwide as of October 2021, ranked by number of active users (in millions) (adopted from (Statista, 2022b))	39
Figure 2-2 Internet user growth worldwide from 2018 to 2023 (in billions) (adopted from (Statista, 2022a)).....	39
Figure 2-3 Number of social network users worldwide from 2018 to 2025 (in billions) (adopted from (Statista, 2022b)).....	39
Figure 2-4. Framework for characterising dark side phenomena. (Adopted from (Tarafdar et al., 2015b))	44
Figure 4-1. An overview of the sequential explanatory mixed methods design.....	65
Figure 4-2. Research Design	67
Figure 4-3. Overview of search strategy and selection process for the systematic literature review.....	73
Figure 4-4. Distribution of Instagram users in Australia in 2020 (in millions) (Adopted from ((Hughes, 2021)))	77
Figure 4-5. Coding steps adopted from (Saldaña, 2021)	94
Figure 5-1. Distribution of the selected publications from 2003 to 2020.....	106
Figure 5-2. The statistics of the reviewed articles based on their studied sample groups	107
Figure 5-3. The statistics of the reviewed articles based their context of study	107
Figure 5-4. The statistics of the reviewed articles based their region of study	108
Figure 5-5. The statistics of the reviewed articles based on their scope of studies.....	108
Figure 5-6. The statistics of the reviewed articles based on their methodology and research method ...	109
Figure 5-7. The statistics of the reviewed articles based on their adopted theories.....	110
Figure 6-1. The results of testing the hypotheses (Theoretical research model)	175
Figure 6-2. Moderating effect of attitude on IT/social media identity.....	183
Figure 6-3. Moderating effect of social norm on IT/social media identity.....	184
Figure 6-4. Moderating effect of personal norm on IT/social media identity.....	185
Figure 6-5. Moderating effect of habit on IT/social media identity	185
Figure 7-1. Conceptual structure of the self-regulation (result of thematic analysis)	197
Figure 8-1. Development of research concepts across SLR-quantitative-qualitative phases.....	205

List of Tables

Table 3-1. IT Identity and its Dimensions (adopted from Dimensions (Carter, 2015)).....	52
Table 4-1. Overview of the search criteria.....	70
Table 4-2. The distribution of the searched publications based on their subject area.....	71
Table 4-3. Instruments and constructs used by prior studies.....	77
Table 5-1. Studies included in narrative synthesis.....	99
Table 6-1. Participants' demographics	144
Table 6-2. Standard Deviation (SD) of the selected observed variables, which measure a latent variable called "self-regulation".....	146
Table 6-3. Communalities of the selected observed variables, which measure a latent variable called "self-regulation"	147
Table 6-4. The result of KMO and Bartlett's Test.....	149
Table 6-5. The total variance which indicates the total number of identified the hidden latent variables/components/factors	149
Table 6-6. The identified hidden latent variables and their observed variables	151

<i>Table 6-7. Internal consistency of the constructs</i>	154
<i>Table 6-8. Outer loading of indicators</i>	155
<i>Table 6-9. Average Variance Extract (AVE) to examine the convergent validity of the constructs</i>	158
<i>Table 6-10. Discriminant validity using HTMT</i>	160
<i>Table 6-11. Discriminant Validity using Fornell-Larcker</i>	162
<i>Table 6-12. Discriminant validity with cross loadings for the low-order latent variable</i>	165
<i>Table 6-13. Discriminant validity with Cross loadings for the high-order latent constructs</i>	168
<i>Table 6-14. The R² and Q² values</i>	171
<i>Table 6-15. The F² values</i>	173
<i>Table 6-16. The result of testing the hypotheses (indirect effects of the independent variables on the dependent one via a mediator)</i>	177
<i>Table 6-17. Specific indirect effects of the independent variables (attitude, social norm, personal norm, habit and self-regulation) on the dependent one (social media addiction)</i>	177
<i>Table 6-18. Effect size ranking system adopted from (Cohen, 1988a)</i>	181
<i>Table 6-19. The effect size of moderation</i>	181
<i>Table 6-20. The result of testing the hypotheses (Moderators)</i>	182
<i>Table 6-21. Results showing the hypotheses (H1-H7), path relationships, β (path coefficient), Lower and higher level of confidence interval, t-values and p-values</i>	186
<i>Table 7-1. Demographics of the interviewees</i>	190
<i>Table 7-2. Examples of meaning units, condensed meaning units and codes</i>	192
<i>Table 7-3. Identified themes from the lens of social cognitive theory</i>	195

Abstract

Addiction as one of the most widespread and destructive effects of excessively using social media platforms deserves more attention. While there are many studies from a health perspective and a few scattered studies from an information systems (IS) perspective on this area, there is a lack of 1) a comprehensive view of this negative phenomenon; 2) an understanding of influential factors (e.g. drivers/causes and predictors) of social media addiction from an IS perspective; and 3) study on mitigation strategies for dealing with this type of addiction. Informed by the extant literature that social media addiction as a maladaptive behaviour is an uncontrolled self-related process, this thesis examines the social media addiction from the perspective of self-related process. This process refers to the cognitive and psychological activities which play a crucial role in shaping how individuals understand themselves, in terms of their actions, emotions, interests, own beliefs, motivations, and healthy behaviours, fostering personal growth and development. While uncontrolled self-related process involves excessive rumination, distorted self-perceptions and self-identity, lack of self-awareness and self-regulation. Thus, with the aim of addressing all these gaps and our understanding that social media is an uncontrolled self-related process, this thesis aims to identify some factors that negatively affect the self-related process causing social media addiction, as well as an intervention that positively affects the self-related process for dealing with this addiction.

Therefore, this thesis offers a theory-based conceptual research model informed by 1) the self-related process perspective to investigate the positive effect of a strong IT/social media identity as a type of self-identity on social media addiction, 2) the dual system theory (DST) to investigate whether reflective (i.e. attitude, social norms, and personal norms) and reflexive (i.e. habit) systems/behaviours reinforce the IT/social media identity, and 2) the social cognitive theory (SCT) to delineate whether the self-regulation as a mitigation strategy negatively influences IT/social media identity and also moderates the relationship between IT/social media identity and its influential factors (i.e. attitude, social norms, personal norms, and habit) to deal with addiction.

To achieve all the objectives above, this study conducts a three-phase research using a mixed method comprised of 1) a systematic literature review (SLR) to provide a

comprehensive picture of the characteristics of social media addiction and also to develop the conceptual model with the objective to identify a potential mitigation strategy, 2) an online survey to examine the research hypotheses, and 3) an interview to propose a conceptual structure of the self-regulation to represent how this mitigation strategy works.

The key findings are: Phase 1 proposes a holistic and novel view of the characteristics of social media addiction including a comprehensive definition, 6 symptoms, 86 influential factors, 17 negative consequences, 8 potential mitigation strategies and 4 supported ones, and self-regulation as a mitigation strategy for this research model. Phase 2 discovers that IT/social media identity positively affects social media addiction, both attitude, and social norms significantly reinforce IT/social media identity but habit and personal norms do not have a positive effect on IT/social media identity. Moreover, this phase reveals that self-regulation negatively affects IT/social media identity and weakens it, and also it manifests that this mitigation strategy moderates the relationship between IT/social media identity and its influential factors attitude and social norms. Phase 3 proposes a conceptual structure of self-regulation to show how to apply this mitigation strategy.

This study makes several important contributions to theoretical knowledge about social media addiction, leading to several practical implications. In brief, this thesis: 1) provides a comprehensive picture of social media addiction, thus addressing the limitation of previous research, with various aspects of addiction been studied in isolation; 2) identifies IT/social media identity as an influential factor in social media addiction. In particular, stronger IT/social media identity was found to increase the probability of one's addiction to social media use. This finding has not been considered as a driver of addiction in IS and psychopathological research disciplines; 3) identifies 'attitude' and 'social norms' from the lens of DST as two influential factors of IT/social media identity; 4) determines 'self-regulation' as an effective mitigation strategy, which is able to weaken IT/social media identity, when dealing with addiction; and 5) proposes a conceptualisation of self-regulation thus addressing a lack of prior studies on effective strategies for increasing self-regulation.

Keywords: Social media, Addiction, negative effects, IT/social media identity, mitigation strategy, self-regulation, dual system theory, social cognitive theory