My Feed Does Not Define Me: The Role of Social Networking Site Usage in Adolescent Self-Concept

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ABSTRACT

Introduction: Adolescence is a critical period of self-concept development. However, with the prevalence of social networking site use amongst this age group, this development is now occurring in a completely different context when compared to previous generations.

Aims: This study aimed to investigate 1) the intensity of adolescent social networking site use, 2) discrepancies between adolescent and parent estimations of their social networking site intensity and their actual social networking site usage, 3) the relationship between social networking site usage and adolescent self-concept and 4) whether this relationship is mediated by adolescents' social comparison tendencies.

Methods: A cross-sectional sample of adolescents ($N = 86$, $M_{age} = 16.8$) and their parents completed a web-based questionnaire composed of reliable and validated measures including the Social Networking Intensity Scale and the Self-Perception Profile for Adolescents. Participants also recorded their social networking site usage for one week using a recording application installed on their device.

Results: Data analyses included descriptive statistics, a Hierarchical Multiple Regression and a One-Way Analysis of Variance. Results showed that participants spent an average of 1 hour and 35 minutes on social networking sites per day. The most popular sites amongst participants were Instagram, Snapchat and WhatsApp and the most common uses included talking with friends and family, finding entertaining content and feeling involved with what is going on with others. A significant difference was found between self and parent-reported social networking site usage and actual social networking site usage. Time spent on social networking sites or social networking site intensity did not predict adolescents' general self-concept.

Discussion: The results of this study did not provide evidence as to an association between social networking site intensity and adolescent self-concept. Results, implications and limitations are discussed in relation to previous literature and theory, educational psychology practice and policy.

DECLARATION

I hereby declare that this thesis is the result of my own original research and does not contain the work of any other individual, save those identified and acknowledged in the usual way.

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LIST OF ACRONYMNS

SNS	Social Networking Site
CYP	Children and Young People
GOI	Government of Ireland
ISPCC	Irish Society for the Prevention of Cruelty to Children
DES	Department of Education and Skills
EP	Educational Psychologist
WoE	Weight of Evidence
ERIC	Education Resource Information Centre
NIH	National Institute of Health
NEPS	National Educational Psychological Service
SNIS	Social Networking Intensity Scale
FBIS	Facebook Intensity Scale
SPPA	Self-Perception Profile for Adolescents
SDRS	Socially Desirable Response Set
SPSS	Statistical Package for Social Sciences
ANOVA	Analysis of Variance
DECPSY	Doctorate in Child and Educational Psychology
PSI	Psychology Society of Ireland
DCYA	Department of Children and Youth Affairs
SDQ-II	Self-Description Questionnaire II
UN	United Nations
JCCYA	Joint Committee on Children and Youth Affairs
NACOS	National Advisory Council for Online Safety
RSES	Rosenberg Self-Esteem Scale
SCC	Self-Concept Clarity
FAF	Facebook Access Frequency
BFAS	Bergen Facebook Addiction Scale
SLS	Satisfaction with Life Scale

Chapter 1 – Introduction

1.1 Research Area and Key Terms

The advent and integration of technology into daily life has brought about abrupt societal transformation and fundamentally altered how we communicate and relate to one another, that is, through the use of Social Networking Sites (SNSs). Adolescents who have grown up in this digital age have not only become adept at navigating these sites but also avid users, as demonstrated through previous research which has found that 96% of adolescents use SNSs, including Snapchat, Instagram, Facebook and Twitter (Dooley, O'Connor, Fitzgerald, & O'Reilly, 2019). Ninety-five percent of adolescents have unlimited and instantaneous access to SNSs because they own a smartphone while 45% report being online almost constantly (Anderson & Jiang, 2018). As SNSs have grown in popularity, so too has my interest in the consequences of engagement with SNSs upon adolescent well-being.

Research has begun to allude to potential benefits of SNS use, which include increased social support, reinforcement of existing friendships and formation of new friendships, greater connectedness with others and an increased sense of belonging (Junghyun & Jong-Eun Roselyn, 2011; Nadkarni & Hofmann, 2012; Shapiro & Margolin, 2014). However, research has also begun to identify negative consequences of SNS usage. Spending time on social media has replaced important activities that mitigate well-being, including sleep and physical activity (Scott & Woods, 2018; Viner et al., 2019). SNSs has also been found to detract from face-to-face interaction, reduce investment in meaningful activities, lead to Internet addiction and expose adolescents to potentially harmful information and ideations (Christakis & Moreno, 2009; Dunlop, More, & Romer, 2011; Hamm et al., 2015; Moreno, Ton, Selkie, & Evans, 2016; Ybarra & Mitchell, 2008). Systematic reviews in this area also yield contradictory findings. While Keles, McCrae, and Grealish (2019) claim that evidence exists for a correlation between SNS use and mental health problems, Best, Manktelow, and Taylor (2014) report mixed or no effect of SNSs on adolescent well-being. However, both sets of authors concur that evidence is inconsistent and insinuate that the relationship between SNSs and adolescent mental health is far too complex for straightforward conclusions. Instead, it is much more likely that the effects of SNS use depend upon the type of sites, the type of activities they are engaging in, the frequency, duration and intensity of their usage and the characteristics of the adolescent using it (Chassiakos, Radesky, Christakis, Moreno, & Cross, 2016). Weinstein (2018) recognised the multi-

factorial nature of SNS use when she stated that rather than SNSs either promoting or harming their well-being, adolescents experience both positive and negative effects of SNS use. She referred to this as the "social media see-saw" (Weinstein, 2018, p. 3597).

One aspect of adolescent well-being which is relatively unexplored in relation to SNS usage is self-concept, despite the substantial self-concept development which occurs throughout this period due to neurocognitive, physical, environmental, interpersonal and social changes. According to Shavelson, Hubner, and Stanton's (1976) multidimensional model of self-concept, self-concept is one's overarching perception of oneself. One of the central tenets of this theory is that our experiences, in all their diversity, constitute the data from which our self-concept is inferred. To reduce the complexity of these experiences, we recode them into simpler forms or categories. The system of categories that we adopt reflects our culture. Since the multidimensional model of self-concept was conceived in 1976, rapid advancements in technology and the ubiquitous inception of SNSs have transformed modern culture. The system of categories of today's adolescents was hypothesised to be different from that of teens 50 years ago. Moreover, not only is the system of categories hypothesised to have changed but also, because today's adolescents are online almost constantly (Anderson & Jiang, 2018), it is expected that their experiences would be radically different from that of the previous generation, leading to significant changes in their self-concept.

1.2 Context

These inquiries come at a time when the assimilation of new media technologies into the lives of children and young people (CYP) has been recognised by the Government of Ireland (GOI). In 2018, the Action Plan for Online Safety was enacted by the GOI and included initiatives such as supporting CYP to engage in safer online activities, equipping teachers to embed digital awareness and citizenship in their practice, developing Online Safety curricular content and collaborating with parents. This action plan was informed by the Irish Society for the Prevention of Cruelty to Children's (ISPCC) "Briefing on Children and Cyber Safety" which involved a review of phone calls and online communications from service users (ISPCC, 2017). In this briefing, the authors cited that one of the primary cyber-related issues that today's CYP were facing was "Identity and Wellbeing" (ISPCC, 2017, p. 16). However, as previously discussed very little has been established theoretically or empirically to support this claim. Thus, this study sets out to provide clarity in this area to ensure that governmental practices are evidence informed. The current inquiry is also taking place

in the context of the recent recognition of the psychological well-being of CYP as a national priority by the GOI. This shift in governmental focus is reflected in the launch of the Wellbeing Policy and Framework for Practice by the Department of Education and Skills (DES), which requires Irish schools to adopt a preventative, whole-school approach to well-being promotion (DES, 2018). This study informs the implementation of this policy because it has long since been established that self-concept is fundamental to the psychological well-being of CYP (Craven & Marsh, 2008). Thus, understanding whether SNS use fosters or undermines self-concept is important because it is likely that it will influence the psychological well-being of CYP. Furthermore, the Wellbeing Policy and Framework for Practice outlined that one of the protective factors that schools should focus on promoting is "opportunities to develop the necessary skills to cope with using online technology in a safe and appropriate way" (DES, 2018, p. 12). This study aims to provide parents, principals, educators and educational psychologists (EPs) with recommendations to support evidence-informed practices in this area.

1.3 Positionality

This research endeavours to establish whether a relationship exists between SNS usage and adolescent self-concept to inform future empirical research, theory, policy development and the practices of principals, educators and EPs. A pragmatist approach has been adopted to do so, whereby the pre-conceived values of the researcher were acknowledged, constantly reflected upon and re-defined. The distinctive contribution of this research was emphasized rather than the nature of reality; the researcher interacted with adolescents, parents, principals and psychologists alike to learn about this phenomenon and the methodology chosen was deemed to be the best-fit for answering the research question; which are key principles of this paradigm.

1.4 Overview

This research is organised into the following components: the Review Paper, the Empirical Paper and the Critical Review Paper. The review paper consists of a systematic literature search of studies in the area of SNS usage and adolescent self-concept, a critical appraisal of selected studies using Gough's Weight of Evidence framework (Gough, 2007) and a thematic synthesis of their results (Thomas & Harden, 2008). Gaps and shortcomings of previous literature are identified which inform the formulation of the research problem in the empirical paper chapter which follows. The empirical paper summarises the aims of my study and relevant literature and describes the research design employed to answer the research questions. It indicates the statistical

analyses used and the results garnered before discussing them in relation to previous research and alluding to their empirical, theoretical and pragmatic implications. The final chapter of this thesis is the Critical Review Paper in which the process of research development, the epistemological position adopted, and the strengths and weaknesses of the research are discussed. This section also includes a reflection upon the ethical and methodological dilemmas and an elaboration of the contributions of the research which are then summarised in the Impact Statement.

Chapter 2 – Review Paper

2.1 Introduction

The evolution of information technology and its subsequent integration into daily life globally has brought with it a new age of communication and self-expression. This is known as social networking, which is the use of websites and applications to interact with real-life friends or connect with users with similar interests (Kuss & Griffiths, 2011). Today's adolescents represent one of the first generations to grow up with this new phenomenon and as a result, they have become avid users; with 94% of American teens accessing SNSs daily, 71% having multiple social media platforms and 73% owning a smartphone (Lenhart et al., 2015). Smartphone ownership among this population has risen by 22% since Lenhart et al.'s (2015) study was conducted (Anderson & Jiang, 2018). The rise in smart-phones ownership has acted as a catalyst to the social networking contagion, with 45% of teens now reporting being online "almost constantly" (Anderson & Jiang, 2018, p. 8). Though less descriptive information is available on Irish adolescents, a recent study showed that 96% of Irish 12-19-year-olds reported having a social media profile or account, with Snapchat, Instagram and Facebook being the most popular sites (Dooley et al., 2019).

Previous research has elucidated the potential benefits of adolescent engagement with SNSs. It has been suggested that social media use has a positive impact on well-being through increased social support and reinforcement of real-world relationships (Junghyun & Jong-Eun Roselyn, 2011). Nabi, Prestin, and So (2013) showed that having a higher number of friends on Facebook significantly predicted higher perceived social support, reduced stress and increased well-being. Research has also demonstrated that engagement with social media leads to greater connectedness with others (Shapiro & Margolin, 2014) and an increased sense of belonging (Nadkarni & Hofmann, 2012).

While various perceived benefits of social media usage have been discerned, other publications suggest possible negative consequences of adolescents' excessive or maladaptive use of these technologies and their applications. Results from studies suggest that social media use increases the risk of mental health problems and compromises well-being amongst adolescent populations (O'Keeffe & Clarke-Pearson, 2011). Research has also begun to establish a link between time spent on social media and increased depressive and anxious symptomology (Andreassen, Pallesen, & Griffiths, 2017). The use of social media has been found to detract from face-to-face

relationships, reduce investment in meaningful activities and lead to Internet addiction (Christakis & Moreno, 2009).

While research has begun to shed light upon the various aspects of adolescent well-being that are affected by social media usage, one relatively unexplored area is the impact of social media usage upon adolescent self-concept.

2.1.1 A Definition of Self-Concept and Related Terminology

Arriving at present-day definitions of self-concept involved a history wrought with contestation, beginning with philosophers, who were later joined by psychologists. However, although the construct of self-concept has been extensively examined, no clear and universally accepted definition was available until Hattie (2014) summarised decades of literature and formulated the following: "Our self-concepts are cognitive appraisals, expressed in terms of descriptions, expectations and/or prescriptions, integrated across various dimensions that we attribute to ourselves" (p. 56). Hattie (2014) went on to explain that these appraisals are frequently examined through a process of self-testing and if the concepts are validated, they are reinforced but if they are disconfirmed, they lead to changes in our conceptions of self. According to Rogers (1959) self-concept is comprised of self-esteem, self-image and the ideal self. Self-esteem (also termed self-worth) refers to one's sense of worth or importance. It is positive or negative regard held about the self and includes both cognitive and affective elements (Rosenberg, 1979). Self-esteem is the evaluative dimension of the self-concept, that is the extent to which self-conceptions are deemed important (Baumeister, 1999). It has been shown that people with low self-esteem have more poorly defined self-concepts while those who have healthy self-esteem have realistic, clear self-concepts (Baumeister, 1993). Self-concept is also comprised of one's self-image which refers to how individuals see themselves and does not have to align with reality (Rogers, 1959). Finally, one's ideal self is the vision they have for themselves (Rogers, 1959). For the purposes of the current review, it is important to note that, though the concepts of self-concept, self-esteem, self-image and the ideal self are intertwined, they are not synonymous, despite scholars often using the terms interchangeably.

2.1.2 The Dimensionality of Self-Concept

Theoretical developments and research in the area of self-concept have led to the refutation of the sparsely evidenced, unidimensional models of the self which emphasise a single, global domain of self-concept (Oosterwegel & Oppenheimer 1990).

Support has now shifted towards the acceptance of a multidimensional model of self-concept, as proposed by Shavelson et al. (1976) (Fleming & Watts, 1980; Marsh, 1987, 1989; Marsh, 1990a; Marsh & Hattie, 1996; Shavelson & Bolus, 1982). According to this model, the self is a multifaceted and hierarchical construct that consists of domain-specific self-concepts (Shavelson et al., 1976). A series of studies have demonstrated that at the apex of the hierarchy is one's latent, general self-concept, which can then be divided into two facets: academic and non-academic self-concepts (Fleming & Watts, 1980; Marsh, 1987, 1989; Shavelson & Bolus, 1982). The academic facet may be subdivided into subject matter areas while the non-academic facet may be subdivided into social, emotional and physical self-concepts which can then be further separated into more specific sub-facets (Shavelson et al., 1976) (see figure 1). In this model, one's global self-concept is relatively stable and consistent and as one descends the self-concept hierarchy, specific domains of self-concept become less stable and more situation specific. However, the authors acknowledge that the global self-concept is not impervious to change, though many situation-specific instances, inconsistent with one's general self-concept, would be required to do so. Given the increasing evidence for the multidimensional model of self-concept, arising from a series of publications, including Marsh (1987, 1989); Marsh, Craven, and Martin (2006) and Song and Hattie (1984), the current review includes research which has investigated global and social, emotional and physical conceptions of the self.

2.1.3 Adolescent Self-Concept Development

Adolescence is a period in which one's self-concept changes profoundly. During pre-adolescence, the number of brain cells in the frontal lobes increases leading to the development of more planning, abstraction and goal-oriented behaviour (Hattie, 2014). Furthermore, neuroimaging research demonstrates that neurocognitive development and functional brain changes in regions involved in self-reflection, contribute to changes in the self-concept, during this period (Sebastian, Burnett, & Blakemore, 2008). As a result of these changes, teens are more likely to engage in social comparison, become aware that others are comparing themselves to them and making judgements about them and place greater importance on these evaluations (Sebastian et al., 2008). Piaget (1964) referred to the actualisation of these processes as formal operational reasoning. Self-concept declines during pre and early adolescence and recovers in later adolescence (Protinsky & Farrier, 1980; Shapka & Keating, 2005). Marsh (1990a) attributes this

Figure 1

Multi-Dimensional, Hierarchical Representation of Self-Concept
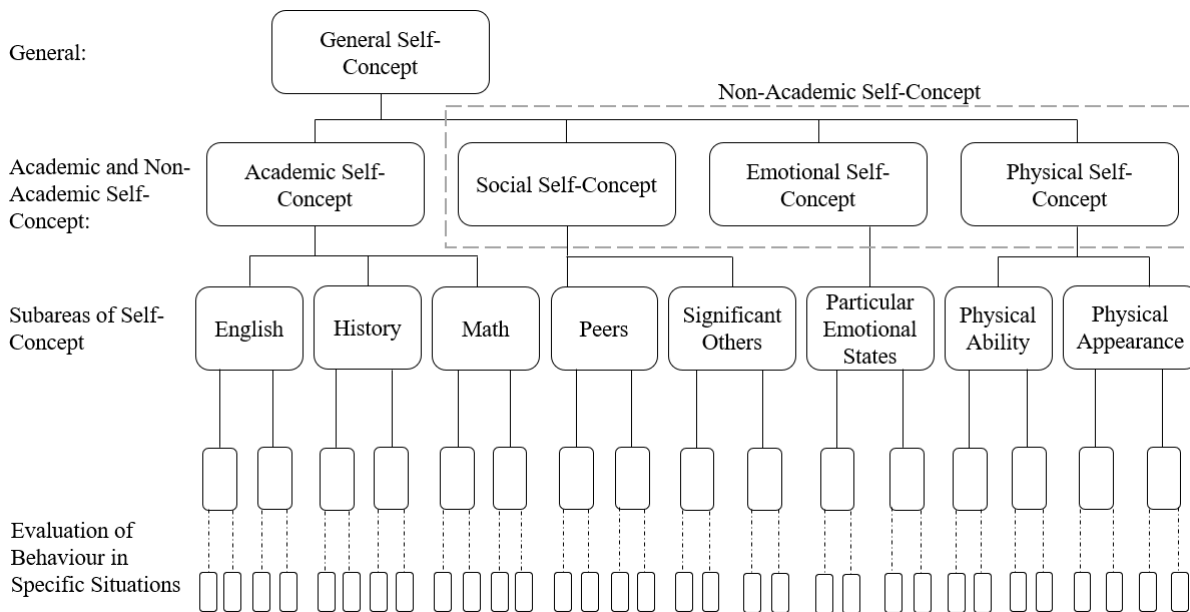
Note. Adapted from Shavelson et al. (1976).

curvilinear age effect to the unrealistically high self-concepts of early adolescents. They have not yet developed the cognitive skills required to critically appraise their competencies and to incorporate information from external sources. As they grow older, they develop more accurate evaluations of their relative strengths and weaknesses and integrate this information into their self-concepts. This results in their conceptions of self becoming more realistic (Harter, 1999). Furthermore, prior to adolescence, a child's self-perception is global and undifferentiated (Shavelson et al., 1976). As they progress to adolescence, their store of experiences and cognitive ability to process this information increase and they begin to differentiate their experiences into domains of self-concept and formulate a system of sub-domains, such as that shown in Figure 1 (Marsh, 1990a). For example, an overarching perception of being academically competent may develop into more differentiated subject area categories. This subsequently allows their perception of self to vary depending on the context, such as being boisterous when with their peers but reserved when with their parents. During adolescence, interpersonal environments undergo rapid change, for example, the transition to secondary school, which is less structured and more independent. Associated with this transition is an increase in expectations of teachers, family and peers and acquirement of new social roles (Hattie, 2014). This period is also characterised by a series of physical changes which are associated with the onset of

puberty, all of which contribute to changes in the self-concept. These series of changes led to what Erikson described as the crisis of identity, which is a period of exploring and establishing their own identity by examining their personal beliefs, morals, goals and values (Sokol, 2009). They also develop their identity through experimentation and sometimes rebellion (Archer & McCarthy, 2007). The ideal conclusion of this crisis is a stable, accurate and positive self-concept is one of the goals of adolescent identity development, in which "past, present, and future are brought together to form a unified whole" (Erikson, 1968, p. 92). However, if the adolescent does not have adequate opportunity to explore their identity, they may face identity confusion. As a result of a series of neurocognitive, physical, environmental, interpersonal and social changes that take place during adolescence, the general self-concept changes significantly throughout adolescence.

2.1.4 A Definition of SNSs and Related Terminology

Social networking has been described as the process of accessing SNSs, which are "web-based services that allow individuals to construct a public or semi-public profile within a bounded system, articulate a list of other users with whom they share a connection, and view and traverse their list of connections and those made by others within the system" (Boyd & Ellison, 2007, p. 211). SNS activities which users engage in include: exchanging messages with friends and family publicly or privately, sharing content, posting status updates, following celebrities or influencers, checking into locations, connecting with others with common hobbies or interests, keeping up to date on current affairs and news, consuming entertaining content, dating, meeting new friends and browsing. Social media is a construct that is often used interchangeably with SNSs; however, the two are not synonymous. SNSs are used to build social networks or relationships with those who share similar interests or real-life connections whereas social media is a means of communicating with a broader audience. For the purposes of the current review, the terms will be used interchangeably. YouTube, Instagram, Snapchat, Facebook, Twitter, Whatsapp, Tumblr, Pinterest and Flickr are currently the most popular online platforms (Anderson & Jiang, 2018). Thus, the current review will include studies that examined these sites individually or another online platform which is in line with the above description of SNSs. Web-based services that were not used primarily for social networking were not included in this review, such as general Internet use or video gaming. While technological advancements in the area of video gaming have enabled users to engage in varying degrees of communication the most

prominent function of video gaming, as documented by previous research, is recreation (Demetrovics et al., 2011; Király et al., 2015; Šporčić & Glavak-Tkalić, 2018). Therefore, this activity was not included in the current review.

2.1.5 Adolescent Self-Concept Development in a New Context

It is clear that the ubiquitous inception of social media has transformed the lifestyles of centennials and thus the formation of their self-concept is now occurring in a completely different arena when compared to previous generations. In recent years, research has begun to elucidate processes by which SNSs may promote adolescent self-concept development including self-expression (Marwick & Boyd, 2011), evaluation of self and others (Siegle, 2011), fostering of group identity (Barker, 2009) and receiving validation and feedback from others (Valkenburg & Peter, 2011). However, research has demonstrated possible processes by which adolescents risk suppressing their self-concept development. Firstly, teens risk lowering their self-concept when constantly comparing their real selves to idealized online representations of others (Parker & Boyd, 2010; Zwier, Araujo, Boukes, & Willemsen, 2011). Moreover, when teens use SNSs to display hoped-for possible selves rather than truthful self-depictions a gap emerges between the teen's real and ideal self and they withdraw from accepting him/herself for who he/she is (Davis, 2010). Valkenburg and Peter (2011) also put forward the fragmentation hypothesis, which was based on Gergen's (1991) theory that technology use leads to identity multiplicity. The fragmentation hypothesis states that to interact with various people in different online environments, teens adopt different personalities. The authors posit that this process fragments adolescent identity and impairs their development of a clear and stable self-concept. This hypothesis relates to the current study because it provides rationale for an investigation of evidence for an association between SNS use and adolescent self-concept.

Evidently, there are both positive and negative implications of using SNSs as a teen. While adolescents' self-concepts benefit from online self-expression, the forming of group identities and online interactions with others, they may be compromised by constant comparison, exaggerated representations of the self and identity fragmentation (Davis, 2010; Parker & Boyd, 2010; Valkenburg & Peter, 2011; Zwier et al., 2011). The processes outlined above point to a possible association between adolescent self-concept development and SNS usage, warranting a systematic review in this area. The need to disentangle the complex relationship between SNS usage and self-concept is of particular importance because it has been found that an unclear sense of self is

detrimental for adolescent well-being (Campbell et al., 1996). Self-concept confusion is also related to decreased psychological adjustment and increased anxiety and depression (Richman et al., 2016). Further, at the time the current review was being conducted, no other study had been published which sought to synthesise the research regarding the relationship between SNS usage and self-concept.

2.1.6 The Current Review

The current literature review set out to critically analyse and summarise the results of research in the area of adolescent self-concept and SNS usage. The purpose of this review was to judge the quality of existing empirical studies and identify gaps in the literature to establish recommendations for future research. The review was designed to address the following review question:

"What is the evidence for a relationship between SNS usage and self-concept?"

This question is addressed by firstly carrying out a literature search. The studies resulting from this search are screened using inclusion and exclusion criteria. The remaining studies' quality and relevance are then appraised using Gough's (2007) Weight of Evidence (WoE) framework and their findings summarised thematically. In the final section of the review, conclusions and implications for theory, research and practice are discussed as well as qualifications and cautions. Lastly, the limitations of the current review and recommendations for future research were provided.

2.2 Methodology

2.2.1 Search Strategy and Data Extraction

In March 2020, a systematic literature search was carried out using the search terms presented in Appendix A. The electronic databases used in the literature search were: Education Resource Information Centre (ERIC), PsycInfo, Psycarticles and Medline. This search yielded 7,076 results. Filters were then applied to the online database search to exclude articles that were not published in peer-reviewed, journal articles. Studies that were not available in English or did not employ a quantitative methodology were also excluded. These criteria, with rationale, are presented in Table 1. This reduced the results to 1,670 articles. Duplicates were then removed reducing results to 1,620. Titles and abstracts of these 1,620 studies were screened using the inclusion criteria in Table 1. 1,537 studies did not meet inclusion criteria and were removed. The remaining 83 articles were then assessed for eligibility and a further 66

studies were removed. The 17 remaining articles that were included in this systematic review are presented in Appendix B. A summary of the studies included in this review can be found in Appendix C. See Figure 2 for a flow diagram which outlines the article selection process.

Figure 2

Flow Chart Demonstrating Study Selection Process

Identification	Records identified through initial database searching (n = 7, 076)	
	Records which met inclusion criteria 1, 2 or 3: (n = 1, 670)	Records excluded as they did not meet inclusion criteria 1, 2 or 3: (n = 5, 406)
Screening	Records after duplicates removed (n = 1, 620)	Duplicates excluded: (n = 50)
	Title and abstracts screened (n = 1, 620)	Records excluded as they did not meet inclusion criteria 4 or 5: (n = 1, 537)
Eligibility	Full-text articles assessed for eligibility (n = 83)	Full-text articles excluded as they did not meet inclusion criteria 4 and 5 (n = 66)
Included	Articles included in systematic review (n = 17)	

Note. Adapted from Moher et al. (2009).

2.3 Results

This section of the review seeks to critically appraise and summarise the results of the 17 studies identified throughout the search process in consideration of their methodological quality and relevance, and topic relevance. This section will begin by

critically appraising the selected studies before describing the characteristics of the selected studies. The studies' will then be analysed in terms of their methodological quality and relevance as well as their topic relevance. Subsequently, a thematic synthesis of their results is presented.

2.3.1 Critical Appraisal

The selected studies were critically appraised using Gough's (2007) WoE framework. This framework outlines a set of formal processes to comprehensively conduct a systematic review and compare studies based on quality and relevance, using four key dimensions: methodological quality (WoE A), methodological relevance (WoE B), topic relevance (WoE C), overall weight of evidence (WoE D). Firstly, WoE A is a non-review specific judgement which assesses the quality of execution of the study (Gough, 2007). WOE A was determined using the quality indicators for correlational research developed by Thompson, Diamond, McWilliam, Snyder, and Snyder (2005). These included judgements of measurement (reliability and validity), sources of data and effect size reporting (see Appendix D). Criteria for WoE A relating to sample size and confounding variables were also adapted from the National Institutes of Health (NIH) Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies (NIH, 2014). The second dimension, WoE B, is a review specific judgement about the appropriateness of the study's design for addressing the review question (Gough, 2007). The NIH Quality Assessment Tool was also used to determine WoE B. The criteria were adapted for the purpose of this review and included judgements of design, demographic information, selectivity in reporting findings, sampling, use of standardised instruments and gender balance (see Appendix E). Thirdly, "WoE C" is a review specific judgement about how suitable the study is for answering the review question (Gough, 2007) and was determined using relevance criteria designed by the author. In this case, WoE C evaluated SNS measures, self-concept measures and age of participants. Detailed criteria for WoE C are provided in Appendix F. Lastly, WoE D is calculated using the average sum of scores for WoE A, WoE B and WoE C. A summary of the WoE ratings is shown in table 2, below (see Appendix G for classification of scores).

Table 1

Inclusion and Exclusion Criteria

	Inclusion	Exclusion	Rationale
1. Type of publication	The article must appear in a peer-reviewed, academic journal. The study uses primary data	The article does not appear in a peer-reviewed, academic journal. The study uses secondary data, is evaluating a measurement tool or is a conference paper, review, report, editorial or dissertation	Peer review journals report research that has been rigorously reviewed
2. Language	The study is published in English	The study is not published in English	Studies which are not published in English cannot be analysed by reviewer
3. Methodology	The study employs quantitative methodology	The study employs qualitative or mixed methods methodology	Quantitative data is more applicable to the review question as it allows the reviewer to make inferences about the relationship between self-concept and SNS use.

			The inclusion of qualitative research would require a different critical appraisal protocol, leading to inequity when comparing qualitative and quantitative studies.
4. Measures	The study contains at least one measure of SNS usage and at least one measure of global, academic, behavioural, cognitive, physical or social self-concept, self-perception, self-image, self-worth, self-esteem or identity.	The study does not measure a direct relationship (involves a mediator) between a form of SNS usage and global, academic, behavioural, cognitive, physical or social self-concept, self-perception, self-image, self-worth, self-esteem or identity.	The current review seeks to examine the relationship between these variables.

Table 2

Summary of the WoE ratings

Author(s)	WoE A	WoE B	WoE C	WoE D
(Andreassen et al., 2017)	2.3	2.0	1.7	2.0
(Appel, Schreiner, Weber, Mara, & Gnambs, 2018)	1.9	1.8	2.0	1.9
(Błachnio, Przepiorka, & Pantic, 2016)	1.1	2.2	1.3	1.5
(Blomfield Neira & Barber, 2014)	1.4	2.0	2.7	2.0
(Cingel & Olsen, 2018)	1.6	2.2	2.0	1.9
(Errasti, Amigo, & Villadangos, 2017)	1.4	2.0	2.0	1.8
(Hawi & Samaha, 2017)	1.7	2.3	1.3	1.8
(Kalpidou, Costin, & Morris, 2011)	1.5	1.8	1.0	1.4
(Kanat-Maymon, Almog, Cohen, & Amichai-Hamburger, 2018)	2.0	2.3	1.3	1.9
(Košir, Horvat, Aram, Jurinec, & Tement, 2016)	1.7	2.3	2.7	2.2
(Sherlock & Wagstaff, 2018)	2.0	1.8	1.0	1.6
(Stapleton, Luiz, & Chatwin, 2017)	2.1	2.5	1.0	1.9
(Valkenburg, Peter, & Schouten, 2006)	1.9	1.8	2.3	2.0
(Valkenburg, Koutamanis, & Vossen, 2017)	1.6	2.3	2.7	2.2
(Vogel, Rose, Roberts, & Eckles, 2014)	1.9	2.0	1.0	1.6
(Wang, Nie, Li, & Zhou, 2018)	2.3	2.3	1.0	1.9
(Woods & Scott, 2016)	1.7	2.0	2.3	2.0

2.3.2 Description of the Included Studies

In design, twelve of the studies included in the review were cross-sectional and one was longitudinal (Valkenburg et al., 2017). Four studies involved multiple parts (Appel et al., 2018; Kanat-Maymon et al., 2018; Sherlock & Wagstaff, 2018; Vogel et al., 2014). Appel et al. (2018) conducted a study consisting of three parts; part one and two were cross-sectional, while part three was longitudinal. Similarly, Kanat-Maymon et al.'s (2018) study design consisted of two parts; one of which was cross-sectional while the other was longitudinal. In contrast, Sherlock and Wagstaff's (2018) and Vogel et al.'s (2014) studies were made up of two parts; a cross-sectional followed by an experimental design. The total sample across the studies was 31,551. Participants ranged in age from 10 to 88. Three studies were conducted in Australia, three in the Netherlands, two in the United States and one each in Austria, Norway, Poland, Spain, Slovenia, Lebanon, Israel, China and Scotland. Of the seventeen studies included in the current review, one examined participants' general as well as academic and social self-concepts (Košir et al., 2016), one studied self-concept clarity (Appel et al., 2018), three studies examined social self-concept (Blomfield Neira & Barber, 2014; Valkenburg et al., 2017; Valkenburg et al., 2006) while the 12 remaining studies measured participants' self-esteem. Moreover, four studies measured participants general SNS usage (addiction, frequency or investment) (Andreassen et al., 2017; Hawi & Samaha, 2017; Valkenburg et al., 2017; Woods & Scott, 2016), while the remaining studied a specific SNS (Facebook, Instagram, We Chat Moments and Twitter). 14 of the 17 studies explored additional variables such as mediating and moderating variables. These included narcissism (n=2), satisfaction with life (n=3), depression (n=3), personality (n=1), adaption to college (n=1), body image disturbance (n=1), anxiety (n=2), social comparison (n=3), physical attractiveness (n=1), sense of power (n=1), social acceptance (n=1), classroom peer relations (n=1) and sleep quality (n=1). Thirteen of the studies entailed both correlational or regression analyses. Two studies included cross-lagged panel analyses (Appel et al., 2018; Valkenburg et al., 2017) due to their longitudinal design. Sherlock and Wagstaff (2018) and Vogel et al. (2014) conducted an analysis of variance on their experimental data. Błachnio et al. (2016) identified levels of Facebook addiction using a cluster analysis and then conducted an analysis of variance to check the difference between the clusters. One study conducted structural equation modelling (Valkenburg et al., 2006), while another conducted a path analysis (Wang et al., 2018).

2.3.3 Methodological Quality

The methodological quality of the 17 studies included in this review received a medium to low rating. While 14 studies' boasted moderately robust methodology (Andreassen et al., 2017; Appel et al., 2018; Cingel & Olsen, 2018; Hawi & Samaha, 2017; Kalpidou et al., 2011; Kanat-Maymon et al., 2018; Košir et al., 2016; Sherlock & Wagstaff, 2018; Stapleton et al., 2017; Valkenburg et al., 2017; Valkenburg et al., 2006; Vogel et al., 2014; Wang et al., 2018; Woods & Scott, 2016), three of the studies' methodologies were deemed as weak in terms of quality of execution in relation to quality standards of correlational research (Błachnio et al., 2016; Blomfield Neira & Barber, 2014; Errasti et al., 2017). The methodological strengths and shortcomings of these studies will now be discussed.

Overall, the majority of the studies included in this review reported reliability coefficients for each instrument based on data in hand. Moreover, the instruments used in the studies produced generally produced a high reliability coefficient (>.80) which demonstrates that the scales used were internally consistent, that is, the items within the scale measure the same construct. However, the methodological quality of several studies was also lowered by failure to report validity (Błachnio et al., 2016; Blomfield Neira & Barber, 2014; Cingel & Olsen, 2018; Errasti et al., 2017; Košir et al., 2016; Sherlock & Wagstaff, 2018; Valkenburg et al., 2017; Valkenburg et al., 2006; Vogel et al., 2014). The authors should provide empirical and theoretical evidence that scores are valid for the inferences being made in the study by inducing score validity from a prior study or test manual and deducing it from data generated within the study (Thompson et al., 2005). The reporting of validity ensures that the results of a study can be interpreted effectively. Thus, the included studies' failure to report validity is a major limitation.

Nearly all studies included in this review reported effect size statistics for primary and secondary outcomes, identified the effect statistic used and interpreted the effect sizes directly and explicitly. Reporting effect size to supplement significance values is highly recommended by scholars, journal editors, and academic associations alike. Effect sizes quantify the strength of associations, directly answer research questions and enable readers to have a clear understanding of the size and the meaning of an effect. However, one study did not provide effect sizes for some secondary outcomes and did not explicitly interpret effect size statistics (Kanat-Maymon et al., 2018).

An inherent limitation of the studies under review was the failure to collect data

from multiple methods/sources. Merely three studies collected data from multiple methods/sources (Kanat-Maymon et al., 2018; Košir et al., 2016; Sherlock & Wagstaff, 2018). Kanat-Maymon et al. (2018) collected data using an online survey and then requested their participants to complete a 21-day diary, which consisted of self-report Facebook addiction, self-worth and self-esteem measures while the participants in Vogel et al. (2014) and Sherlock and Wagstaff (2018) collected data using a questionnaire and an experiment. Košir et al. (2016) collected data on participating students' social acceptance from teachers. The other studies included in this review collected single source, self-report data. The collection of data from two or more sources, also known as triangulation, is advantageous as it allows for the validation of data through cross-verification of sources (Cohen, Manion, & Morrison, 2007). Furthermore, if different methods are employed, it allows researchers to corroborate their results, increasing the study's credibility and validity. The use of multiple methods/respondents to answer a research question also provides a rich and complex view of the phenomena of interest (Cohen et al., 2007). This use of multi-source data is of particular relevance in studies examining SNS usage because previous research has shown that SNS self-report measures demonstrate poor internal consistency and systematic patterns of misreporting (Scharkow, 2016).

Another major limitation of the studies included in this review was their failure to justify their sample size with a power description or variance and effect estimates. Three studies conducted a power analysis to ensure that their sample size was adequate (Sherlock & Wagstaff, 2018; Stapleton et al., 2017; Valkenburg et al., 2006), while the remaining studies did not justify their sample size. A power analysis is normally conducted before the data collection to help the researcher determine the smallest sample size that is suitable to detect an effect at the desired level of significance (Bujang & Baharum, 2016). If a study is underpowered, it will be statistically inconclusive and may make the protocol a failure (Mertens, 2014). For example, one study had a small sample size of 70 participants and as a result, the interpretation of the findings warrant caution (Kalpidou et al., 2011). Similarly, using too many subjects in a study is expensive and exposes more participants to the procedure, unnecessarily (Mertens, 2014). Andreassen et al. (2017) had a sample size of 22,532. Studies that use a large sample size have less variability within their sample and are therefore more sensitive to the detection of a statistical significance. Mertens (2014, p. 503) asserts that "virtually any study can have statistically significant results if a large enough sample size is used" and advocates for the use of effect sizes because they allow researchers to

report the practical significance of the differences. However, the researchers were guilty of reporting their findings based on a dichotomous decision of significance and non-significance and not attaching importance to their small effect sizes (Andreassen et al., 2017). Thus, it is likely that these authors committed a type one error, whereby their statistical analyses were overpowered, resulting in the insignificant emerging as significant and the rejection of a true null hypothesis.

The final common limitation of studies included in the current review was the failure to measure and statistically adjust for potential confounding variables. While four studies statistically adjusted for the impact of confounding variables (Andreassen et al., 2017; Cingel & Olsen, 2018; Kanat-Maymon et al., 2018; Wang et al., 2018), the remaining studies did not. As a result, these studies may have been subject to confounding bias, which is when a researcher attempts to relate an exposure to an outcome but measures the effect of a third factor (Grimes & Schulz, 2002).

The studies identified according to the review-specific inclusion criteria presented a range of methodological limitations that reduced their overall methodological quality. 14 of the studies included received a rating of 'medium' while three studies received a low rating, using Gough's (2007) weight of evidence framework to appraise methodological quality. No study included in the current review elicited strong methodological robustness.

2.3.4. Methodological Relevance

Each of the studies appraised as part of the current systematic review received a medium rating in terms of methodological relevance. Thus, the studies' methodologies are deemed as promising in terms of appropriateness for answering the research question.

A relative strength of the studies included in the current review was their propensity to describe the group of people from which the study participants were selected or recruited, using demographics. A further strength was that most of the studies included in this review used high-quality instruments, which had been extensively researched and yielded high reliability and validity, to measure outcome variables. Thus, most studies received high ratings in these areas.

Twelve of the 17 studies included in the review employed cross-sectional designs. While this type of study design is widely critiqued as causation cannot be inferred, the research question set out to uncover evidence for a relationship between

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SNS use and adolescent self-concept because knowledge in this area is in a state of infancy. Cross-sectional study designs allow the researcher to conclude whether there is a relationship between variables and thus, these studies received a moderate rating because they were appropriate for answering the review question. Five studies went a step further by employing longitudinal or experimental designs (Appel et al., 2018; Kanat-Maymon et al., 2018; Sherlock & Wagstaff, 2018; Valkenburg et al., 2017; Vogel et al., 2014). This allowed the authors to provide evidence on the causal mechanisms underlying the relationship between SNS usage and self-concept and shed light on the direction of potential causal pathways. Therefore, they received a high-quality rating.

Six of the studies included in this review received a lower rating in the area of methodological relevance due to apparent selectivity in reporting findings, which is known as reporting bias (Appel et al., 2018; Errasti et al., 2017; Kalpidou et al., 2011; Kanat-Maymon et al., 2018; Sherlock & Wagstaff, 2018; Valkenburg et al., 2006). The authors of these studies merely reported significant findings or over-emphasized results which were not outlined in their hypotheses or research questions. Researchers have an ethical responsibility to report the results of their studies according to their a priori plans.

The method of sampling was also assessed in the critical appraisal of the studies included in this review. None of the studies included in this review employed random sampling, which ensures that each member of the population has an equal probability of being selected to participate in the study. However, it is common for researchers to be unable to employ random sampling, particularly when performing research on particular subgroups, such as adolescents, due to logistical inconvenience. Two studies employed cluster and systemic sampling methods, which is laudable as it is highly likely that their samples are representative of the population in question (Errasti et al., 2017; Hawi & Samaha, 2017). Most of the studies included in this review used convenience sampling whereby participants were drawn from a part of the population that was close to hand. However, there are limitations to convenience sampling, including large sampling error, decreases in the representativeness of the sample and selectivity bias. Thus, these studies obtained a low score in terms of methodological relevance, in this area.

Finally, a common limitation of the studies included in this review was the over-representation of females which was apparent in the samples in studies conducted by Andreassen et al. (2017), Appel et al. (2018); Błachnio et al. (2016); Kalpidou et al.

(2011) and Vogel et al. (2014). Sherlock and Wagstaff (2018) purposively studied females. An uneven representation of gender results in a study's findings being ungeneralizable to the general population. Given that the current review is concerned with the relationship between self-concept and SNS usage in males and females, the findings of these studies must be interpreted cautiously. Therefore, they received a lower rating under the methodological relevance criteria.

While these studies were not without their limitations pertaining to methodological relevance, overall, they provided promising evidence that they were fit for the purpose of answering the proposed review question.

2.3.5. Topic Relevance

When the studies included in this review were judged about the relevance of the focus of their evidence for the review question, three of the five studies obtained high scores due to their focus and context being highly relevant to the research question (Blomfield Neira & Barber, 2014; Košir et al., 2016; Valkenburg et al., 2017), six studies obtained medium scores (Andreassen et al., 2017; Appel et al., 2018; Cingel & Olsen, 2018; Errasti et al., 2017; Valkenburg et al., 2006; Woods & Scott, 2016), while the remaining studies received low scores.

The first criterion of topic relevance was the type of SNS usage measures employed. 11 of the studies in the current review used measures assessing a specific SNS, including Facebook, Instagram, Twitter and WeChats. This specificity limits the generalisability of their findings to other SNSs. Additionally, the current review seeks to examine participants' total use of SNSs. In particular, Facebook was the most commonly studied SNS, with eight studies examining the relationship between Facebook and self-esteem, self-concept or self-worth. Thus, the studies under review received a medium quality rating in the criterion as the scales they used to measure SNS usage are not clearly linked to the review question whereas studies which measured general SNS usage received a high topic relevance rating (Andreassen et al., 2017; Blomfield Neira & Barber, 2014; Hawi & Samaha, 2017; Valkenburg et al., 2017; Woods & Scott, 2016).

The studies under review were also assessed on the measures of self-concept they employed. Košir et al. (2016) measured participants' global as well as academic and social self-concepts while Appel et al. (2018) measured participants' self-concept clarity. These studies received the highest rating on this criterion because the variables

under study were considered most closely related to the research question. Three studies received a moderate rating in this area because they measured a specific dimension of self-concept, social self-concept (Blomfield Neira & Barber, 2014; Valkenburg et al., 2017; Valkenburg et al., 2006). The remaining studies measured self-worth or self-esteem which as previously discussed are not synonymous with self-concept, though closely related. Therefore, these studies received a low topic relevance rating.

The third criterion of topic relevance was participant age. The current systematic review set out to investigate networked teens because they are particularly vulnerable due to the social, psychological and neurological changes they are experiencing during that period. According to Erikson (1968), the ages of 12-18 represent a critical period of self-concept and identity formation. However, preliminary databases searches demonstrated that a mere seven studies conducted research relating to SNS usage and self-concept or self-esteem in adolescents. Given that research investigating the SNS usage and adolescent self-concept is in its infancy, it was decided that adult populations would be included in the current review. While research conducted upon adult populations is not as relevant to the research question, it was included in this review because it may alert the inquirer to processes by which SNS usage relates to self-concept in adults. These processes may be similar in or applicable to adolescents and are worthwhile investigating. However, studies which investigated the relationship between self-concept and SNS usage among teenagers were considered to be of most relevance and received a high-quality rating in this regard (Blomfield Neira & Barber, 2014; Cingel & Olsen, 2018; Errasti et al., 2017; Košir et al., 2016; Valkenburg et al., 2017; Valkenburg et al., 2006; Woods & Scott, 2016).

The focus and context of three of the 17 the studies presented are highly relevant to the research question posed by the current systematic review (Blomfield Neira & Barber, 2014; Košir et al., 2016; Valkenburg et al., 2017), which is evidenced by the high-quality ratings they received when subjected to the WoE C criteria. Three of the five studies presented with promising evidence as to their topic relevance (Appel et al., 2016a-b; Fullwood et al., 2016). Overall, the 16 of the 17 studies which were included in this systematic review were generally rated as medium quality while one of the studies included was rated as low quality due to methodological shortcomings and low topic relevance (Kalpidou et al., 2011).

2.3.6. Synthesis of Findings

To answer the current review question, the results of the studies identified through the literature search were synthesised, using a thematic synthesis approach (Thomas & Harden, 2008). Originally, this approach was devised as a method of amalgamating the findings of qualitative research, however, it has since been adapted to the synthesis of quantitative research (Ryan et al., 2018). The thematic synthesis approach allows for the identification and development of analytic themes in primary empirical data (Thomas & Harden, 2008). A thematic synthesis was chosen for the purposes of this review for a number of reasons. First, it fulfilled the aims of this review, which was to synthesise existing evidence for a relationship between SNS usage and self-concept and identify patterns and gaps in previous research. Secondly, this approach was chosen because there was heterogeneity in participant characteristics, settings, outcomes and measures employed. Further, the designs of the studies included in this review ranged from correlational to longitudinal and experimental. Therefore, the diversity of the studies would render a quantitative synthesis of study results meaningless, as differences in effects may be obscured. Moreover, a quantitative synthesis of study results is also not recommended when studies are of poor quality and according to Gough's WoE framework, none of the studies have yielded a strong methodological robustness. Lastly, the thematic synthesis process offered a rigorous, systemic and transparent method of deriving and integrating themes from previous research. The first stage involved coding the results of previous studies while the second stage involved the identification and grouping of similarities into descriptive themes. Lastly, the descriptive themes were synthesised across studies and their meaning was interpreted in light of the studies their methodological quality and relevance as well as topic relevance weighting and in relation to review question posed in the current study (Ryan et al., 2018). Five themes emerged from the thematic synthesis: self-esteem and SNS usage, gender and age differences, contingent self-worth, domains of self-concept and self-concept clarity and SNS usage.

2.3.6.1. Self-Esteem and SNS Usage. 12 of the 17 studies included in the current review examined the relationship between self-esteem and SNS usage. 10 of these studies uncovered a significant, negative correlation between self-esteem and SNS usage (Andreassen et al., 2017; Błachnio et al., 2016; Blomfield Neira & Barber, 2014; Cingel & Olsen, 2018; Errasti et al., 2017; Hawi & Samaha, 2017; Kalpidou et al., 2011; Sherlock & Wagstaff, 2018; Vogel et al., 2014; Woods & Scott, 2016). The

majority of these studies employed the Rosenberg Self-Esteem Scale to measure self-esteem while measures of SNS usage negatively associated with self-esteem included SNS addiction, emotional investment and duration and frequency of SNS use. Four of these studies investigated general SNS usage, five examined Facebook usage, one measured Facebook and Twitter usage while one looked at participants' use of Instagram. It is important to take into consideration that four of the ten studies which uncovered a significant negative correlation between SNS usage and self-esteem were of weak methodological quality while six provided promising evidence as to this relationship.

In contrast to the above findings, a study that also boasted promising methodological rigour revealed that the intensity of Instagram use did not significantly predict self-esteem (Stapleton et al., 2017). Moreover, Wang et al. (2018), who conducted a study of mediocre methodological quality found that WeChat (a popular SNS in China) use intensity and received likes were positively associated with self-esteem. The findings of Wang and colleagues are in such juxtaposition to previous literature that they call for an investigation of the differences between WeChat and other SNSs, including Facebook and Instagram, as these findings suggest that this platform's interface or settings may be more conducive to promoting self-esteem. One further and notable finding of Wang et al's (2018) is that while WeChat intensity and received likes on posts were related to self-esteem, status updates were negatively associated with self-esteem. The authors posit that posting status updates is a form of self-promotional behaviour, which may be deleterious for self-esteem. This finding indicates that it is not only important to consider the intensity of one's SNS activity but also the type of activities which one is engaging in on SNSs.

Furthermore, four studies set out to elucidate processes underlying the relationship between self-esteem and SNS usage (Sherlock & Wagstaff, 2018; Stapleton et al., 2017; Vogel et al., 2014; Wang et al., 2018). Sherlock and Wagstaff (2018) uncovered that the negative relationship between Instagram and self-esteem was mediated by upward social comparison, which they described as the propensity to self-evaluate by comparing oneself to one's superiors or inferiors as a means of determining one's self-worth. According to Sherlock and Wagstaff (2018), users tend to present an idealised version of themselves on SNSs, resulting in their followers engaging in upward social comparison, which is damaging to their self-esteem. Similarly, Vogel et al. (2014) found that those who use Facebook more frequently had poorer self-esteem

and that this was mediated by participant propensity to engage in upward social comparison on Facebook. They concluded that upward social comparison underlies the deleterious relationship between Facebook use and self-esteem. Inconsistent with these findings, however, when Stapleton et al. (2017) investigated the mediating role of social comparison on the relationship between the intensity of Instagram use and self-esteem, they found this model to be insignificant. The authors attribute this inconsistency to the methodological limitation of adapting the well-established Facebook Intensity Scale to measure Instagram usage, despite differences between the two platforms. The Facebook Intensity Scale was designed to measure users' emotional connectedness to Facebook and its integration into their daily lives (Ellison, Steinfield, & Lampe, 2007). However, the authors' adapted version of this scale may not have captured the nuances between Facebook and Instagram. For example, the Facebook "Friends" feature offers users mutuality in their online friendships whereas Instagram allows users to merely follow other users' accounts, an action that may not be reciprocated. The authors also note that it is possible that SNS usage may harm self-esteem, but that this may depend on the extent to which an SNS user seeks external validation from peers. Wang et al. (2018) put forward the theory that SNS use intensity and received likes positively relate to self-esteem through personal power and social acceptance. The authors claim that social acceptance mediates this relationship because receiving likes on SNSs gives users a sense of inclusion, which boosts their self-esteem. They posit that personal power operates as a mediator of this relationship because the act of posting pictures and statuses which exhibit their success or achievement may give them a sense of personal power and influence, which are also major predictors of self-esteem.

While there exists evidence for a negative relationship between self-esteem and SNS usage, the contradictory findings suggest that this relationship is not straightforward. Thus, it is important to consider motivations for engaging in SNSs, such as self-promotion, social comparison or social acceptance as well as considering the type of activity they are engaging in online as these may mediate this relationship.

2.3.6.2. Gender and Age Differences. One major finding emerging from several studies is that females appeared to be more susceptible to addiction to SNSs and negative psychological outcomes due to their motivations for using SNSs, including social comparison and self-validation (Andreassen et al., 2017; Blomfield Neira & Barber, 2014; Sherlock & Wagstaff, 2018). Firstly, Andreassen et al. (2017) demonstrated that the addictive use of social media was more prevalent among women

than men. However, the conceptualisation of SNS use as an addictive behavioural disorder has been subject to widespread critique. Carbonell and Panova (2017) argue that there is insufficient empirical evidence to claim that SNS addiction exists and that it does not meet clinical criteria for addiction, including severe physical and psychological consequences, dependence, risky use. Alternatively, they propose a revision of terminology in this area and suggest terms such as "problematic", "maladaptive" or "excessive" SNS use. The authors ascribed their results to women's inclination to seek out activities involving social interaction while men prefer solitary activities, such as video gaming. Additionally, merely having an SNS account was associated with depressed mood and lower self-esteem for female adolescents when compared with male adolescents (Blomfield Neira & Barber, 2014). The authors posit that this may be caused by the propensity of female adolescents to seek validation about themselves from others to self-evaluate. SNSs are providing a new environment for them to do so, however, the tone of feedback they receive on SNSs may sometimes be perceived as negative, which as a result, negatively affects their levels of self-esteem and mood. According to these authors, having an SNS account was associated with having a higher social self-concept in male adolescents, lending to the notion that SNSs may be beneficial for this subgroup. The authors postulate that male adolescents utilise SNSs as a tool to develop their social skills, increasing their social competence Thus, males and females' motivations for using SNSs may be different. These dissimilar motivations for using SNSs have resulted in more negative psychological outcomes for female youth. A further study conducted by Sherlock and Wagstaff (2018) indicated that the frequency of Instagram use was associated with depressive and anxious symptomology, low levels of self-esteem and body image disturbance in females. As previously alluded to, these relationships are mediated by social comparison. According to this study, women are more likely to make social comparisons than men and Instagram provides the conditions for them to do so excessively. This can be damaging to their mental health (Sherlock & Wagstaff, 2018). The second part of this study found that beauty and fitness and travel images were particularly to blame for the negative association between Instagram use and psychological outcomes because these images led to decreases in self-rated attractiveness, which subsequently led to decreases in women's anxious and depressive symptomology, self-esteem and body dissatisfaction.

Four studies investigated whether SNS use and its effects varied by age (Andreassen et al., 2017; Blomfield Neira & Barber, 2014; Kalpidou et al., 2011;

Sherlock & Wagstaff, 2018). Firstly, those lower in age were more likely to be addicted to SNSs than their older counterparts (Andreassen et al., 2017). The authors suggest that this is because young adults use SNSs to forge their social identity, through the establishment, development and maintenance of social ties and through self-evaluation and validation processes, which occur as a result of feedback on their postings (Andreassen et al., 2017). A further study indicated that adolescent investment in SNSs, that is how important SNSs are to them, is linked to poorer indicators of adjustment, including lower self-esteem and higher depression, for youth (Blomfield Neira & Barber, 2014). The authors postulated that teens use SNSs as a means of comparing themselves to others, socially and because it is the propensity of SNS users to display idealised versions of themselves and accentuate the positive aspects of their lifestyles. These representations may cause adolescent onlookers to believe that other SNS users' lifestyles are much better than their own. Thus, according to Blomfield Neira and Barber (2014), adolescents are comparing themselves to exaggerated and unrealistic standards, which may partly explain the relationship between SNS use and poorer psychological outcomes. Furthermore, Kalpidou et al. (2011) found that younger college students were more emotionally invested and spent more time on Facebook, which was associated with lower self-esteem. Younger college students also had fewer friends than their older counterparts. Moreover, the number of Facebook friends that younger students had was negatively related to academic and emotional adaptation to college; but positively associated with social adjustment among older students. The results of this study suggest that the relationship becomes positive later in college life as students become more adept at navigating Facebook to connect socially with their peers. Moreover, Sherlock and Wagstaff (2018) found that when compared to older participants, younger participants spent more time on Instagram and engaged in higher levels of social comparison. As previously highlighted, social comparison behaviour on SNSs has been shown to impair self-esteem (Sherlock & Wagstaff, 2018; Vogel et al., 2014). When taken together, these findings indicate that the lower the age, the greater the susceptibility to negative effects associated with social comparison.

    2.3.6.3. Contingent Self-Worth. Contingent self-worth is defined as the extent to which self-worth is based on the approval of others (Kanat-Maymon et al., 2018). This construct was examined by Kanat-Maymon et al. (2018) and Stapleton et al. (2017). Kanat-Maymon et al. (2018) found that contingent self-worth was positively related to addictive and excessive use of Facebook. In the second part of their study, the

authors employed a longitudinal design by asking participants to complete a daily diary. The results of this study indicated that day-to-day changes in Facebook addiction were explained by daily fluctuations in contingent self-worth. The authors explain this finding by stating that someone who bases their self-worth on social acceptance is likely to place importance on the formation and maintenance of social ties and the avoidance of rejection. This may result in maladaptive self-regulation which is manifested as excessive Facebook use. The results of this study provide evidence for the importance of self-worth which is contingent upon social acceptance in the manifestation of Facebook addiction.

Stapleton et al. (2017) found that social comparison on Instagram mediated the relationship between contingent self-worth and self-esteem. The authors postulated that engaging in social comparison on Instagram provides youngsters whose self-worth is based on peer acceptance the opportunity to self-validate, subsequently reinforcing their self-worth (Stapleton et al., 2017). However, by self-validating through the process of social comparison, youngsters may be subject to correspondence bias, which is the assumption that others' behaviours reflect their dispositions as opposed to being explained by the context in which they occur. It is suggested that by doing so, their self-esteem is negatively affected (Stapleton et al., 2017). However, the variance in self-esteem explained by social comparison on Instagram and self-worth contingent on approval from others was small and there is a large quantity of variance unaccounted for; therefore, these results should be interpreted with caution. Moreover, the relationship between Instagram intensity and social comparison was moderated by contingent self-worth, suggesting that emerging adults who use Instagram more intensely engage in greater levels of social comparison when they have higher levels of self-worth that is contingent upon approval from others.

The studies conducted by Kanat-Maymon et al. (2018) and Stapleton et al. (2017) shed light on the role which contingent self-worth plays in SNS addiction and the relationship between SNS intensity and social comparison. Overall, these studies provide an enhanced understanding of the mechanisms that link SNS use to self-esteem and the individual differences in the effects of SNS use.

2.3.6.4. Domains of Self-Concept. This theme encapsulates the relationship between SNS usage and various domains of self-concept, including social, peer relations and academic self-concept, as investigated by Blomfield Neira and Barber (2014), Košir et al. (2016), Valkenburg et al. (2006) and Valkenburg et al. (2017).

Firstly, Blomfield Neira and Barber (2014) found that the frequency of SNS use was associated with higher social self-concept, which they defined as the extent to which they feel competent in forming and maintaining friendships. They suggested that adolescents who access SNSs more frequently have increased social interactions with peers. As a result, their social skills are enhanced, and they evaluate themselves as more competent in the domain of social self-concept.

Valkenburg et al. (2017) also uncovered a positive correlation between adolescents' SNS use and their social self-concept. The authors found that this relationship was explained by the amount of positive feedback that adolescents received on SNSs. However, the authors did not find longitudinal evidence that adolescents' SNS use increases their social self-concept. The authors posited that this may be due to fluctuations in social self-concept which occur during adolescence, as this is a critical period of self-concept development. Thus, the participants' social self-concept may have been more susceptible to peer interactions during adolescence; however, their social self-concept became more stable as they transitioned to adulthood. Furthermore, the results of their longitudinal study also indicated that social self-concept influenced their SNS use in subsequent years. The authors explained this phenomenon using the "rich-get-richer hypothesis", which states that adolescents who have a higher social self-concept are more adept at navigating social situations and are more likely to use social media. By doing so, they receive positive feedback, which further enhances their social self-concept and self-esteem. The authors conclude that the effects of SNSs - whether beneficial or detrimental - are determined by how they are used and the characteristics and behaviour of the user.

Valkenburg et al. (2006) also uncovered evidence for an indirect relationship between SNS frequency and social self-concept and well-being. According to the authors, this relationship was mediated by the tone of reactions that adolescents received on their profiles. The authors reported that the majority of adolescents who used the Dutch SNS, known as "CU2", received positive feedback on their accounts. Receiving positive reactions to their SNS activity promoted adolescents' social self-concept and well-being while negative feedback depleted adolescents' social self-concept and well-being.

Similarly, Košir et al. (2016) uncovered that Facebook users reported higher peer relation self-concept, which is their perception of their popularity among peers, how easily they make friends and the quality of their peer interactions, compared to

non-users. However, this was not reflected by more objective measures of peer-acceptance including sociometric measures or teacher-reported peer acceptance. The authors also found that Facebook membership is more related to self-perceived than to actual peer relations. They cited enhanced connectedness with offline friends as a result of online interactions or confounding variables such as parenting behaviours as possible explanations for this difference. The authors concluded that SNS usage is beneficial for adolescents' social lives.

Košir et al. (2016) cited the important role which perceived academic competence plays in adolescent psychological adjustment and the paucity of previous research examining the relationship between SNS usage and academic self-concept as the impetus of their study, which investigated differences between Facebook users and non-users' academic self-concept. The authors define academic self-concept as skills, ability and interest in school subjects, in general. They did not find significant differences between Facebook users and non-users in the domain of academic self-concept.

The results of these studies demonstrate that a positive relationship is evident between adolescents' SNS use and their social self-concept and that this relationship was caused by the amount of positive feedback that adolescents received on SNSs (Blomfield Neira & Barber, 2014; Valkenburg et al., 2017; Valkenburg et al., 2006). Furthermore, having an SNS profile leads to a higher peer relation self-concept. Another important finding highlighted in these studies was that the effect of using SNSs is dependent on the predisposition and behaviour of the adolescent.

2.3.6.5. Self-Concept Clarity and SNS Use. While this theme was not common among studies selected for this review, it is of high topic relevance to the research question which was set out at the beginning of this review. Further, while merely one article examined this relationship, it consisted of three studies. The article in question examined the relationship ' between emotional connectedness to Facebook (Facebook intensity) and self-concept clarity, which is the extent to which one's self-concept is clear and consistent (Appel et al., 2018).

In the first of the three studies, Appel et al. (2018) disseminated questionnaires to a convenience sample of 14-26-year-olds. They uncovered a negative association between self-concept clarity and SNS intensity, a finding which is in line with the aforementioned fragmentation hypothesis (Appel et al., 2018). In their second cross-

sectional study, a negative association between Facebook intensity and self-concept clarity in 14-20-year-olds was also found (Appel et al., 2018). In particular, two passive modes of SNS usage were negatively related to self-concept clarity: "looking at others' reactions to my postings" and "just browsing and liking, nothing else" (Appel et al., 2018, p. 165). While both studies indicated that Facebook intensity predicted self-concept clarity, causal interpretations of their results are inappropriate, due to their cross-sectional designs.

To disentangle the causality of the relationship between Facebook intensity and self-concept clarity, the authors conducted a longitudinal study and found that more intensive use of SNSs predicted less self-concept clarity over time, whereas the reverse effect was not substantiated (Appel et al., 2018). The evidence presented by Appel et al. (2018) indicates that emotional attachment to Facebook leads to an unclear and inconsistent self-concept, substantiating the fragmentation hypothesis. The results of these studies did not provide support for the self-concept unity hypothesis, indicating that self-concept is not validated through online feedback from others (Appel et al., 2018)

2.4. Discussion

The overall aim of this review was to appraise and synthesise a systematically searched body of literature to examine the evidence for a relationship between SNS use and general self-concept. Following a systematic literature search and screening to ensure that studies fulfilled the eligibility criteria, a total of 17 studies were found to eligible for inclusion in the current review. The selected studies were then critically appraised using Gough's WoE Framework (2007) in the following three dimensions: methodological quality, methodological relevance and topic relevance.

Firstly, 14 studies of the studies included in the current review demonstrated moderately robust methodology while three of the studies' methodologies were deemed weak in terms of their quality of execution when assessed using the quality standards of correlational research. The methodological quality of the 17 studies included in this review received a medium to low rating. Methodological strengths arising from the research in this area included the reporting of reliability coefficients and effect sizes. Methodological limitations included failure to report validity, to collect data from multiple methods/sources, to justify their sample size and to measure and statistically adjust for potential confounding variables. When considering the findings of previous research in this area, it is important to recognise the limitations of these studies. The

range of methodological limitations in these studies indicates that their findings should be interpreted with caution and calls for future research in this area to execute more rigorous methodology to discern the true association between adolescent self-concept and SNS usage.

Secondly, the methodological relevance dimension of this study's critical appraisal sought to answer the question "how appropriate are the studies' designs for addressing the review question?". The results of the critical appraisal indicated that their designs were relatively appropriate for addressing the review question though no study displayed strong methodological relevance. While the studies included in this review generally provided sufficient demographic information and the use of standardised instruments, shortcomings including reporting bias, sampling bias and gender imbalance.

Thirdly, evaluating the studies based upon the topic set out at the beginning of this review proved useful in that it shed light upon the current state of the research in this area. A mere six studies examined general SNS usage. The majority examined the relationship between Facebook use and self-concept or self-esteem. This is problematic because recent findings have stated that Snapchat, Instagram and YouTube have surpassed Facebook in terms of popularity amongst teens (Anderson & Jiang, 2018). It is not possible to apply this research to other SNSs because of the major differences between platforms. The most popular SNS among teens nowadays are photo and video sharing platforms which allow users to share content with a wider audience. Digital technologies are constantly updating, and it is up to researchers to stay on top of the latest trends. Moreover, countless websites have risen and fallen in popularity since the inception of SNSs. Once a site becomes redundant, the findings of these research studies cease being relevant. To counteract this, research which examined adolescents' total or general SNS usage was considered the most relevant, of which six studies exist. Further, research investigating the relationship between SNS usage and general self-concept is scant. Appel et al.'s (2018) study, which measured self-concept clarity, was considered the most relevant to the current study. However, self-concept clarity is a structural feature of general self-concept and does not equate to the notion itself. Four studies measured domains of self-concept while 12 studies have measured self-worth or self-esteem, which as previously discussed are not synonymous with self-concept, though closely related. Thus, no study has examined the relationship between SNS usage and general self-concept, which presents as a major gap in the literature.

Moreover, a mere seven studies have investigated the relationship between SNS usage and measures of the self, including self-esteem and social self-concept, in adolescents, despite this being a critical period of development. This also presents a major gap in the existing literature.

While methodological and relevance shortcomings emerged from the appraisal of the studies included in this review, they were not necessarily devoid of meaning and thus, a thematic synthesis of their findings was conducted. Five main themes emerged. The first finding of this synthesis was that there exists substantial evidence for a negative association between self-esteem and SNS usage (Andreassen et al., 2017; Błachnio et al., 2016; Blomfield Neira & Barber, 2014; Cingel & Olsen, 2018; Errasti et al., 2017; Hawi & Samaha, 2017; Kalpidou et al., 2011; Sherlock & Wagstaff, 2018; Woods & Scott, 2016). It has been postulated that this association may be caused by social comparison (Sherlock & Wagstaff, 2018; Vogel et al., 2014). This is in line with previous literature which states that teens engage in social comparison as a process of self-validation (Hattie, 2014) and SNSs provide teens with a platform to do so (Siegle, 2011). However, teens risk lowering their self-concept when constantly comparing to others (Parker & Boyd, 2010) Also, teens are comparing their real selves with peers' idealized online representations, which may further damage their self-esteem (Zwier et al., 2011). However, research pertaining to social comparison mediating the relationship between self-esteem and SNS use was limited and inconsistent, warranting further investigation (Stapleton et al., 2017). Personal power and social acceptance were also proposed as possible mediators of this relationship (Wang et al., 2018).

Gender and age differences in SNS use emerged as a second theme from the thematic synthesis. A major finding emerging from a number of studies is that females are more susceptible to SNS addiction (Andreassen et al., 2017) and negative psychological outcomes due to their motivations for using SNSs, including social comparison and self-validation (Blomfield Neira & Barber, 2014; Sherlock & Wagstaff, 2018). Furthermore, those lower in age were more likely to be affected by the addictive use of social media than their older counterparts (Andreassen et al., 2017; Sherlock & Wagstaff, 2018). Additionally, investment in SNSs is linked to lower self-esteem for youth (Blomfield Neira & Barber, 2014) and higher levels of social comparison. As previously discussed, adolescence is a period in which one's self-concept changes profoundly, with ones' general self-concept decreasing in early adolescence and increases in later adolescence (Protinsky & Farrier, 1980; Shapka & Keating, 2005).

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Thus, teens' self-concept may be more malleable during early adolescence and more susceptible to the negative consequences of SNS use.

Contingent self-worth was the third theme that emerged. Those who use Instagram more intensely engage in greater levels of social comparison when they have higher levels of self-worth that is contingent upon approval from others (Stapleton et al., 2017). This indicates that social comparison on Instagram is a process by which youngsters whose self-worth is contingent on peer approval self-validate to reinforce their self-esteem (Siegle, 2011). According to the authors, however, because of their propensity to engage in correspondence bias, their attempts to validate their self-esteem online are unsuccessful and deleterious to their self-esteem (Stapleton et al., 2017). Kanat-Maymon et al. (2018) built on this by revealing that someone who bases their self-worth on social acceptance is likely to place importance on the formation and maintenance of social ties and the avoidance of rejection resulting in excessive Facebook use.

The fourth theme was about how various domains of self-concept related to self-concept. As previously discussed, the self is a multifaceted and hierarchical construct and consists of domain-specific self-concepts (Shavelson et al., 1976). Research has begun to examine how these domains, including social, peer relations and academic self-concept, relate to SNS use (Blomfield Neira & Barber, 2014; Košir et al., 2016; Valkenburg et al., 2017; Valkenburg et al., 2006). Preliminary evidence exists for a positive relationship between SNS intensity and adolescents' social self-concept (Blomfield Neira & Barber, 2014; Valkenburg et al., 2017). Positive feedback on the adolescent's postings enhances their social self-concept and well-being, whereas negative feedback decreases their social self-concept and well-being (Valkenburg et al., 2006). This finding is consistent with the self-concept unity hypothesis which states that SNSs provide adolescents opportunities to express their identities and receive validation and feedback from others, which enhances their self-concept (Valkenburg & Peter, 2011). Moreover, SNS users have higher peer relation self-concept, compared to non-users, regardless of their actual peer relations (Košir et al., 2016). SNS users and non-users do not differ significantly in terms of their academic self-concept (Košir et al., 2016). When taken together, these studies demonstrate that the relationship between SNS usage and self-concept is most likely complex, involving many factors such as the attributes and behaviour of the adolescent engaging with SNSs. These findings also warrant consideration because Shavelson et al.'s (1976) multi-dimensional model of

self-concept sets out that evaluations of the self in various domains of self-concept contribute to one's global self-concept. Thus, it would be worthwhile to investigate whether SNS use is associated with self-concept indirectly, through these sub-domains.

The final theme derived from the thematic synthesis of the studies included in this review was self-concept clarity and SNS use. According to Appel et al. (2018), self-concept clarity was negatively related to SNS intensity suggesting that intensive use of Facebook contributes to a less clear and coherent sense of self. The evidence was proposed by Appel et al. (2018) provides support for the fragmentation hypothesis which states that teens adopt multiple personas to interact with various SNS users, causing their identity to become fragmented (Valkenburg & Peter, 2011). However, Appel et al. (2018) did not illustrate the underlying processes and the circumstances by which this proposed relationship is transmitted.

2.4.1. Directions for Future Research.

The relationship between global self-concept and SNS usage represents a major area of potential inquiry due to the current paucity of research examining this area, as derived from the current review. Secondly, a common methodological limitation of the studies included in this review was their failure to measure and statistically adjust for potential confounding variables. Various factors that influence an individual's general self-concept have been discerned through research, including, physical appearance, emotional stability and academic performance (Shavelson et al., 1976). Future research should endeavour to measure and statistically adjust for these variables to ensure that their role in predicting general self-concept is statistically accounted for. An additional methodological limitation of the current research was the failure to collect data from multiple measures or sources. The majority of the studies included in the current review collected data using single-source, self-report measures. Scharkow (2016) has suggested this is particularly problematic in studies that examine SNS usage because the accuracy of SNS self-report measures is low and subject to misreporting (Scharkow, 2016). Thus, future research should endeavour to use multiple methods/respondents to account for the discrepancy between actual and reported usage of SNSs. Fourthly, there is a scarcity of research investigating the relationship between SNS usage and self-concept in adolescents despite this being a critical period of self-concept development. Thus, future research should endeavour to examine the relationship between these two constructs amongst this age group. There appears to be conflicting evidence regarding the association between self-esteem and SNS usage being mediated by social comparison

(Sherlock & Wagstaff, 2018; Stapleton et al., 2017). Future research should endeavour to disentangle this complex relationship. Finally, the current review uncovered evidence for both the self-concept unity hypothesis and the fragmentation hypothesis (Appel et al., 2018; Valkenburg et al., 2017; Valkenburg & Peter, 2011; Valkenburg et al., 2006). Thus, future research should aim to establish the directionality of the relationship between self-concept and SNS usage. In summary, future research must establish whether and how SNS usage and adolescent self-concept relate while collecting data from multiple sources and measures and adjusting for confounding variables.

2.4.2. Strengths and Limitations

The strengths of the current systematic review are that it employed a transparent and replicable method of critical appraisal, that is, Gough's WoE framework. This is also true of the thematic synthesis used in this review paper. It not only offers a distinctive method of synthesising quantitative research; it is a staged approach and would be easily replicated. The current systematic review is not without its limitations. The Centre for Reviews and Dissemination (2009) recommends that at least two researchers conduct systematic reviews as this allows for shared decision making and reduces the risk of bias in study selection. However, this review was conducted by a single researcher. However, inclusion criteria and search strategy were explicitly stated and therefore the study selection procedure is replicable and transparent. Another limitation of this review is that findings have been synthesized qualitatively. While it is not necessary for a systematic review to include quantitative analyses of individual study findings, Bartolucci and Hillegass (2010) recommend that when possible, quantitative analyses should be preferred over qualitative-only synthesis.

2.4.3. Conclusion

The current systematic literature review conducted a critical review and thematic synthesis of existing evidence for the relationship between SNS usage and adolescent self-concept. It illustrated that a growing body of evidence is suggesting that a relationship exists between SNS usage and self-esteem. However, it cannot be concluded that this relationship is causative due to the lack of methodological shortcomings present throughout previous research including weak research design, failure to collect data using multiple methods/sources and failure to measure and to statistically adjust for potential confounding variables. While one article demonstrated intensive use of SNSs contributed to a more diffuse sense of one's self, others have

alluded to processes by which SNSs may promote adolescents' general self-concept. Thus, research that has been conducted in the area of SNS use and self-concept is in its infancy, particularly in adolescence, despite it being a critical period of self-concept development. Moreover, much of the evidence which does exist is contradictory. Further research is warranted in the area to whether this relationship exists and its directionality.

Chapter 3 – Empirical Paper

3.1. Introduction

Technological advancements have rapidly accelerated over the past 20 years, leading to an increasingly technology-dependent society and a generation of children and adolescents who are "growing up wired" (Shapiro & Margolin, 2014, p. 1). A significant milestone in this societal transformation was the advent of SNSs, which are internet-based services that allow users to create profiles, accumulate a list of friends/followers and navigate other users' profiles (Boyd & Ellison, 2007). The use of SNSs has become widespread among centennials with 94% of them accessing SNSs daily and 71% of them reporting that they use multiple platforms, including Snapchat, YouTube and Instagram (Lenhart et al., 2015). The rise in smart-phone ownership among adolescents to 95% has contributed to the pervasiveness of SNS, with 45% of this cohort now reporting being online almost constantly (Anderson & Jiang, 2018). SNSs are important to adolescents for communicating with close friends, keeping up with what's going on in their peer-group and expressing themselves creatively (Rideout & Fox, 2018).

Research has begun to elucidate the benefits of SNS engagement including increased social support, reinforcement of existing friendships and formation of new friendships, greater connectedness with others and an increased sense of belonging (Junghyun & Jong-Eun Roselyn, 2011; Nadkarni & Hofmann, 2012; Shapiro & Margolin, 2014). SNSs also provide adolescents who are insecure about their physical appearance, experiencing shame, loneliness and distress or whose interests differ from their peers, a platform to practice their social skills (Reid & Weigle, 2014). However, research has also begun to identify negative consequences of maladaptive SNS use, which may be detrimental to adolescent well-being. Firstly, the duration of SNS use, type of SNS activity, SNS investment and SNS addiction negatively relate to mental health problems in adolescents, including depression, anxiety and psychological distress (Keles et al., 2019). The displacement hypothesis has been proposed to explain this phenomenon, whereby the duration of SNS use displaces important activities that are protective for adolescent well-being, such as sleep (Scott & Woods, 2018) or physical activity (Viner et al., 2019). SNSs has also been found to detract from face-to-face interaction, reduce investment in meaningful activities and lead to Internet addiction (Christakis & Moreno, 2009). Secondly, SNSs have been charged with exposing adolescents to potentially harmful information and ideations, including cyberbullying,

suicidality, self-harm and sexual solicitation and harassment (Dunlop et al., 2011; Hamm et al., 2015; Moreno et al., 2016; Ybarra & Mitchell, 2008). Thirdly, teens are prone to using SNSs as a platform of broadcasting risky behaviours, including those relating to substance use, sex and violence without consideration of the consequences, including negative evaluation from others, the normalisation of these behaviours and encouragement of unwanted expectations in others (Reid & Weigle, 2014). However, one aspect of adolescent psychosocial development which is relatively unexplored in relation to SNS usage is self-concept.

Self-concepts are "cognitive appraisals, expressed in terms of descriptions, expectations and/or prescriptions, integrated across various dimensions that we attribute to ourselves" (Hattie, 2014, p. 37). Theoretical support has shifted from unidimensional models of the self which emphasise a single, global domain of self-concept to a structured, multi-faceted and hierarchical model of self-concept (Shavelson et al., 1976). According to Shavelson et al. (1976), the self-concept is primarily formed through our interpretations of previous events and experiences though it is heavily influenced by environmental reinforcements and evaluations of significant others. To reduce the diversity and complexity of previous events and experiences, they are organised into categories, resulting in a multi-faceted self-concept. These facets of self-concept form a hierarchy from experiences in particular situations at the bottom of the hierarchy, which are then categorised into academic and non-academic self-concepts (Shavelson et al., 1976). The academic self-concepts can be further subdivided into subject matter areas while the non-academic self-concept can be divided into social, emotional and physical components. At the apex of the hierarchy is one's general self-concept. While global self-concept is reasonably stable over extended periods of time, significant change at lower levels of the hierarchy can lead to lasting change at upper levels. The system of categories adopted by an individual reflects their culture (Shavelson et al., 1976) Modern culture has changed dramatically since the multidimensional model of self-concept was proposed in 1976. Advancements in technology and the ubiquitous inception of the internet, Wi-Fi, computers, smartphones, and SNSs have revolutionised daily life. Thus, this study sets out to bring Shavelson et al.'s (1973) model into the 21st century.

Several longitudinal studies show that self-concept declines in early adolescence then rises through late adolescence and emerging adulthood (Protinsky & Farrier, 1980; Shapka & Keating, 2005). This profound self-concept change is due to the physical,

neurological, psychological and social development occurring throughout this epoch. During the pre-adolescence, the number of brain cells in the frontal lobes increases leading to the development of more abstract cognitive functions, self-organisation and intentional behaviour (Konrad, Firk, & Uhlhaas, 2013). Further, neuroimaging research indicates that neurocognitive development and functional brain changes in regions involved in self-reflection, contribute to changes in the self-concept (Sebastian et al., 2008). Because of these structural brain changes, teens are more likely to compare themselves with others, comprehend that others are making comparisons and judgments about them and consider these judgments as more important (Sebastian et al., 2008). Piaget (1964) referred to the actualisation of these processes as the formal operational stage. The adolescent continues to coordinate and integrate the parts of their self-concept and a more multi-faceted, structured self-concept develops (Shavelson et al., 1976). During adolescence, interpersonal environments undergo rapid change, for example, the transition to secondary school, which is less structured and more independent (Hattie, 2014). Associated with this transition is a change in expectations for the students and by teachers, family and peers and the adolescent also takes on new social roles; both of which contribute to changes in the self-concept. This period is characterised by a series of physical changes which are associated with the onset of puberty (Bonnie, Backes, Alegria, Diaz, & Brindis, 2019). This series of changes led to what Erikson (1968) described as the crisis of identity, which is a period of exploring and establishing their own identity, through experimentation and sometimes rebellion. The ideal conclusion of adolescence is a stable, accurate and positive self-concept; however, if the adolescent does not have adequate opportunity to explore their identity, they may face identity confusion (Sokol, 2009). With the ubiquitous inception of SNSs, the formation of adolescent self-concept is occurring in a different context when compared to previous generations.

Both theory and research have pointed to possible processes in which SNSs may promote adolescent self-concept development. SNSs provide optimal conditions for adolescent identity exploration through the cultivation of an online profile, content sharing and creation and online group membership (Livingstone, 2008; Marwick & Boyd, 2011). This allows adolescents to distinguish themselves from their peers, to reflect their beliefs and needs and validate their self-concepts (Kim & Ko, 2007). SNS usage among teenagers has been found to foster one's sense of group identity (Barker, 2012). According to self-identity theory (Tajfel & Turner, 1979), having a strong sense

of group identity bolsters feelings of belongingness, which, in turn, enhances self-concept (Allen, Ryan, Gray, McInerney, & Waters, 2014). Additionally, SNSs provide adolescents with opportunities to express their identities and receive validation and feedback from others, which enhances their self-concept (Valkenburg & Peter, 2011). This is known as the self-concept unity hypothesis. However, research has demonstrated possible processes by which adolescents risk suppressing their self-concept development. Firstly, teens risk lowering their self-concept when constantly comparing their own real selves to idealized online representations of others (Parker & Boyd, 2010; Zwier et al., 2011). Moreover, when teens use SNSs to display hoped-for possible selves rather than truthful self-depictions a gap emerges between the teen's real and ideal self and they withdraw from accepting themselves for who they are (Davis, 2010). SNSs can foster a negative self-concept because teens adopt different personalities to interact with various people online, resulting in fragmented identities (Valkenburg & Peter, 2011). This is known as the fragmentation hypothesis.

In their seminal study, Appel et al. (2018) uncovered a negative relationship between participant's emotional connectedness to Facebook, also known as Facebook intensity, and self-concept clarity. The authors found that two passive modes of SNS usage, in particular, were negatively related to self-concept clarity: "looking at others' reactions to my postings" and "just browsing and liking, nothing else" (Appel et al., 2018, p. 165). Their research also included a longitudinal study that found that more intensive use of SNSs predicted less self-concept clarity over time (Appel et al., 2018). Though this study suggested that the relationship between SNS use and self-concept may be negative in directionality, it did not provide insight into the processes or circumstances by which this relationship operates. Otherwise, research investigating the relationship between SNS usage and general self-concept is scant. Thus, this represents a major area of inquiry.

Previous research has yielded substantial evidence for a negative association between self-esteem and SNS usage (Andreassen et al., 2017; Błachnio et al., 2016; Blomfield Neira & Barber, 2014; Cingel & Olsen, 2018; Errasti et al., 2017; Hawi & Samaha, 2017; Kalpidou et al., 2011; Sherlock & Wagstaff, 2018; Woods & Scott, 2016). However, it cannot be concluded that this relationship is causative due to the methodological limitations which were prevalent throughout these studies. Moreover, self-esteem and self-concept are not conceptually synonymous, though inextricably linked. The self is made up of a knowledge component, self-concept, and an evaluative

component, self-esteem (Campbell, 1990). While the self-concept consists of beliefs about one's attributes, self-esteem is our acceptance of these conceptions of self and is based upon what we consider to be important, worthwhile or esteemed (Campbell, 1990; Hattie, 2014). While substantial evidence exists for a negative relationship between self-esteem and SNS use, this cannot be directly applied to self-concept because, though related, they are separate constructs. However, due to the lack of research examining the relationship between self-concept and SNSs, research in the area of self-esteem and SNS usage serves as a starting point to base future investigations.

Previously conducted research has proposed that social comparison mediates the relationship between SNS use and self-esteem (Sherlock & Wagstaff, 2018; Vogel et al., 2014). Social comparison is an innate process by which individuals evaluate their attributes and abilities in relation to others, to determine whether their self-appraisals are accurate (Festinger, 1954). Social comparison has been postulated to mediate the relationship between SNS use and self-esteem because when teens are constantly comparing themselves to idealistic online representations others (Parker & Boyd, 2010) or as Steers, Wickham, and Acitelli (2014, p. 701) put it "seeing everyone else's highlight reels", they risk damaging their self-esteem. However, this area of research has yielded contradictory findings. Stapleton et al. (2017) did not uncover a significant mediation between Instagram use and self-esteem. The authors argue that SNS use can have deleterious effects on self-esteem, but only when young people place importance on approval from peers (Stapleton et al., 2017). An investigation into whether this mediational model applied to the relationship between SNS use and self-concept is warranted because social comparison is an important process in the acquisition of accurate self-appraisals (Festinger, 1954) and the above studies suggest that SNSs enable teens to do so at the mere click of a button. The current study endeavours to provide clarity into whether social comparison mediates the relationship between self-concept and SNS use.

Research has uncovered a positive relationship between adolescents' SNS use and their social self-concept which is mediated by the amount of positive feedback that they receive on SNSs (Blomfield Neira & Barber, 2014; Valkenburg et al., 2017; Valkenburg et al., 2006). This finding supports the self-concept unity hypothesis (Valkenburg & Peter, 2011). However, self-concept clarity has been found to negatively relate to SNS intensity suggesting that intensive use of Facebook contributes to a more diffuse sense of one's self (Appel et al., 2018), which is in line with the fragmentation

hypothesis (Valkenburg & Peter, 2011). Thus, previous research has demonstrated evidence for both the self-concept unity hypothesis and the fragmentation hypothesis and has not successfully established the directionality of the relationship.

The majority of previously conducted research has examined the relationship between Facebook and self-concept or self-esteem. This limits the applicability of previous research to today's teens because Snapchat, Instagram and YouTube have surpassed Facebook in popularity among this cohort (Anderson & Jiang, 2018). The most popular SNSs among teens nowadays are photo and video sharing platforms whereas Facebook contains more textual content. SNSs are constantly evolving while countless SNSs have become defunct and it is the responsibility of researchers to stay on top of the latest trends. Further, once an SNS becomes redundant, the findings of research studies conducted on it cease being relevant. Moreover, a paucity of research has investigated the relationship between SNS use and self-concept in adolescents, despite this being a critical period of self-concept development. This also presents a major gap in existing literature.

A prevalent methodological limitation in this area is the failure to measure and statistically adjust for potential confounding variables. Various factors that contribute to one's general self-concept have been discerned through decades of research, including, physical appearance, emotional stability and academic performance (Harter, 2012a). Adjustment for these variables would ensure that their role in predicting general self-concept is accounted for. Another common methodological limitation in previous research was the failure to collect data from multiple measures or sources instead of relying on single-source, self-report measures. This is problematic in studies that examine SNS usage because the accuracy of SNS self-report measures is low and over and underreporting are commonplace (Scharkow, 2016). It has been postulated that this is due to memory errors to social-desirability biases (Valkenburg & Peter, 2011).

Clarification of the role of SNS use in the development of adolescent self-concept important because it is central to psychological well-being, which in turn, is a reliable predictor of health and long-term positive adjustment (Gómez-López, Viejo, & Ortega-Ruiz, 2019). Self-concept facilitates the attainment of desirable outcomes that underpin human potential, including happiness, motivation and academic achievement (Craven & Marsh, 2008). An unclear sense of self is detrimental for adolescent well-being and self-concept confusion is related to decreased psychological adjustment and increased anxiety and depression (Campbell et al., 1996; Richman et al., 2016).

Moreover, a negative self-concept precipitates poor social and behavioural functioning which contribute to adolescent mental health problems; whereas a positive self-concept is regarded as a protective factor that impedes psychological problems and promotes general well-being (Žukauskienė, 2014). A number of empirical studies have linked a negative self-concept to hostility, delinquency, anxious and depressive symptomology and eating disorders (Landazabal, Pérez, & Mozaz, 2008; O'Dea, 2006; Ybrandt, 2008). This is particularly pertinent because a steep rise in anxiety and depression among CYP has been observed in Ireland in recent years, a trend which is reflected globally (Fitzgerald et al., 2020; Polanczyk, Salum, Sugaya, Caye, & Rohde, 2015). This has instigated a moral panic in society, with the inception of new media and technologies often being blamed (Twenge, Joiner, Rogers, & Martin, 2018). Thus, it will be informative to shed light on the relationship between SNSs and adolescent self-concept because it would either open or close avenues of empirical investigation into whether self-concept plays a role in the highly contested relationship between SNSs and well-being.

The current study set out to examine whether networked teens' self-concept is particularly vulnerable online, due to the social, psychological and neurological changes they are experiencing during that period and to adapt Shavelson et al.'s (1976) multidimensional model of self-concept to the 21st century. The overarching aim of this study is to establish the role SNS usage plays in the development of adolescent self-concept while secondary aims included, disentangling whether social comparison mediates this relationship and providing insight into adolescent SNS usage in an Irish context. Taking into account the underexplored areas and limitations of previous research, the current study set out to answer the following four research questions: (1) What is the extent of Irish adolescents' SNS usage? (2) Are there differences between self-reported, parent-reported and actual duration of SNS usage? (3) How are the duration and intensity of SNS use associated with adolescent self-concept? (4) Is the relationship between SNS use and adolescent self-concept mediated by social comparison? Based on prior research, it was hypothesised that Irish adolescents would be avid users of SNSs, spend a significant duration browsing SNSs and that their activities and sites used would reflect global trends. Additionally, it was hypothesised that Irish parents and teens would underestimate the duration of their SNS use due to social desirability bias. It was also hypothesised that SNS use and adolescent self-

concept would be associated, and that this relationship would be mediated by social comparison.

3.2. Methodology

3.2.1. Pilot Study

A pilot study was conducted with a convenience sample of students, in which they completed the questionnaire in paper and pencil format. The purpose of the pilot was to 1.) obtain estimates of expected response rates and the duration of survey completion; 2.) to establish the validity and reliability of scales utilised and 3.) to determine the feasibility of the study procedure. A focus group was then facilitated. The purpose of this was to establish participants' understanding and interpretation of the questionnaire items and instructions and to provide them with the opportunity to review and comment on the questionnaire in terms of the content, sequence, validity and wording of the questions, the response formats and the structure (Testa & Coleman, 2006). 9 adolescents participated in the pilot study and focus group. The sample consisted of 3 males and 6 females, all of whom were aged 16 years. An analysis of the questionnaire's reliability using Cronbach's alpha revealed that the scales utilised in this pilot study were reliable and acceptable ($\alpha = 0.73–0.94$). An analysis of the questionnaire using a factor analysis was conducted and clear discrimination between the factors emerged, with high loadings and few cross-loadings, providing evidence for the questionnaire's validity. Typographical and formatting errors were raised by participants in the focus group and amended accordingly.

One participant reported that the layout of the Self-Perception Profile for Adolescents (SPPA) was confusing. This participant was referring to the "structured alternative format" which the SPPA employs, whereby the adolescent is first asked to decide which teenagers he or she is most like and then whether the description on the side he/she chose is "*Really True for Me*" or "*Sort of True for Me*" (please see Figure 3a). As a result, the format of this scale was redesigned to resemble a Likert scale (please see Figure 3b) and more detailed instructions were provided. Though the dichotomous interface of the SPPA's format was amended it still achieved the effectiveness of the SPPA's question format, whereby the wording of the question suggests that half of the adolescent population themselves in one way, whereas the other half view themselves in the opposite manner, legitimising participant choices. The option of selecting 1-4 broadens the range of choices over the typical two-choice

format. In addition, none of the choices involves the response "*False*" or "*Not Like Me*." Rather, the adolescent is asked to decide which teenager they are most like. The amended version of the SPPA also followed the same scoring, coding and analysis system. Two concerns with the study design emerged as a result of conducting the pilot study. Firstly, the return of parental consent forms was low. As a result, it was decided that the dissemination of the questionnaire online may increase parental engagement. Secondly, SNS usage was subject to over-reporting. This was resolved by asking participants' parents about the intensity of their child's SNS use and asking participants to record the duration of their SNS usage in the last 7 days, by accessing the recording application installed on their device.

Figure 3

Amendment to the SPPA's format

Note. A: SPPA's original format; B: Amended SPPA format.

3.2.2. Design.

The current study employed a cross-sectional design.

3.2.3. Participants

An a priori power analysis indicated that to obtain 80% power for the number of variables with an alpha level of .05 and estimated effect size of $r = 0.2$ (as recommended by Ferguson, 2009), a sample size of 88 was required.109 parents accessed the questionnaire. Of these, 86 parents and their adolescents completed the questionnaire. Figure 3 demonstrates the attrition rates. The sample consisted of a total

of 86 adolescents (69% female). The mean (*M*) age of participants was 16.8 years (standard deviation [*SD*] = 0.79 years, range 16–18 years).

3.2.4. Procedure

Approval for the study was obtained from Mary Immaculate College's institutional research board. Following approval, participants were recruited by requesting secondary school principals to share a link to the online questionnaire on their school's website. A list of the 723 secondary schools in Ireland was retrieved and sorted randomly. School principals were contacted by phone and email, provided with details of the study and asked to share a hyperlink to the questionnaire on their school's website. They were also asked to contact parents (by email or text) to alert them to the presence of the hyperlink to the questionnaire on their website. In total, 10 post primary schools agreed to disseminate the questionnaire. Of these 10 schools, two were single sex (one all-boys and one all-girls), and eight schools were mixed sex. To promote the study, posters were hung in participating schools, flyers were sent to parents, announcements were made by principals at school plays, parent evenings and assemblies and reminder texts/emails were sent to parents. Study information was also presented at two National Educational Psychological Service (NEPS) team meetings and attending EPs then shared this information with their allocated post-primary schools. To increase participation rates further, convenience sampling, whereby post-primary school teachers known to the researcher were asked to share the study information with their principal, and snowball sampling techniques, whereby participating post-primary school principals were asked to recruit other post-primary principals, known to them, were also employed. These sampling methods were continued until a sufficient number of participants were obtained.

Upon viewing or being alerted to the link, parents accessed the online questionnaire and were provided with information regarding the study. They ticked a box if they consented to participate, completed a short parental questionnaire regarding their teens' social media usage, received information as to what will be involved for their child if they allowed them to participate and checked a box if they consented for their child to participate. They then gave the device to their child who was given information regarding the study and asked to give their consent to participate. The adolescent aged between 16 and 18 years old, then accessed and completed the online questionnaire, which took approximately 15 minutes to complete.

Figure 4

Participant Flow Diagram
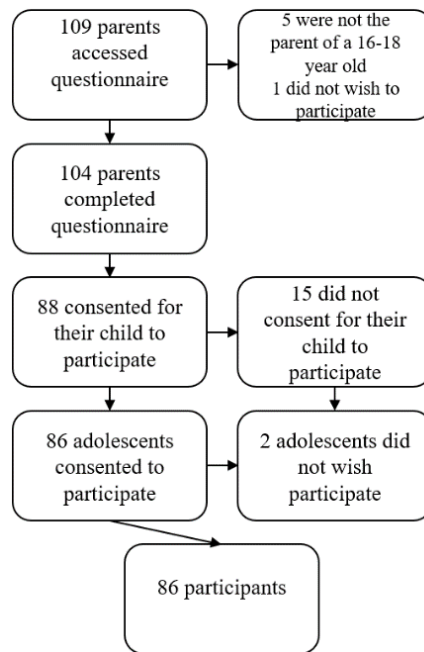
3.2.5. Measures

Data were collected from parents and their teens at one time point, using an online questionnaire that was composed of reliable and validated measures. A copy of the questionnaire used in this study can be found in Appendix H.

3.2.5.1. SNS Usage. Firstly, the investigator developed a series of questions to elicit parents' perspectives of their child's SNS behaviour, including the number of SNSs used (How many SNSs or applications does your child have accounts with?), type of SNSs used (Which of the following SNSs or applications does your child have accounts with?), frequency of use (How many times a day does your child access SNSs or applications?), duration of use (How long does your child spend on SNSs or applications per day?), frequency of postings (How often do they post on SNSs or applications?) and time of use (When does your child access SNSs or applications?). Their teenagers were asked the same questions; however, three further investigator-developed questions were added. One of these assessed the purpose of their use (What do you use SNSs and applications for?). The other two items assessed whether they accessed SNS before they got out of bed in the morning (Do you check SNSs or applications before you get out of bed?) or before they went to sleep at night? (Is checking SNSs or applications the last thing you do before going to bed?). These items

were included because they were informative as to the degree of embeddedness of SNSs into the participants' daily life.

3.2.5.2. SNS Intensity. SNS intensity is defined as the extent to which an individual is actively engaged in SNS activities (Salehan & Negahban, 2013). The Social Networking Intensity Scale (SNIS) was adapted by Salehan and Negahban (2013) from the Facebook Intensity Scale (FBIS) (Ellison et al., 2007), which is one of the most widely used and systemically validated SNS engagement scales (Sigerson & Cheng, 2018). The SNIS consists of three subscales, each of which demonstrated acceptable internal consistency values, as derived from the current data set: SNS intensity ($\alpha = 0.84$), mobile phone addiction ($\alpha = 0.85$) and the use of mobile phones to access SNSs ($\alpha = 0.72$). Each construct is measured by five items, constituting a total of 15 items. On the SNS intensity and mobile phone addiction subscales, participants indicated their agreement with a series of statements on a 7-point Likert scale ranging from *Strongly Disagree* (1) to *Strongly Agree* (7). The use of mobile phones to access SNSs was also a 7-point Likert scale; however, responses ranged from never to always. Parents were asked to complete the SNS intensity subscale while the 16-18 year olds completed all three subscales.

3.2.5.3. Self-Concept. The SPPA (Harter, 2012b) was used to measure the 16-18-year old participants' self-evaluations of competence in nine specific domains. The domains and their internal consistency values, based on the data at hand, are as follows: scholastic competence ($\alpha = 0.40$), social competence ($\alpha = 0.76$), athletic competence ($\alpha = 0.92$), physical appearance ($\alpha = 0.83$), job competence ($\alpha = 0.70$), romantic appeal ($\alpha = 0.79$), behavioural conduct ($\alpha = 0.75$) and close friendship ($\alpha = 0.76$), as well as their global self-concept ($\alpha = 0.81$). Each subscale contains five items, amounting to 45 items in total. A sample item is: "*Some teenagers feel like they are just as smart as others their age BUT Other teenagers aren't so sure and wonder if they are as smart*". The respondent is asked to decide which adolescent they are most similar to and choose whether the description is "*Really True for Me*" or "*Sort of True for Me*". The question format was designed to prevent participants from providing socially desirable responses.

3.2.5.4. Social Desirability. The Socially Desirable Response Set (SDRS) (Hays, Hayashi, & Stewart, 1989) was included in the questionnaire. This scale assesses participants' tendency to give desirable answers in response to attitudinal questions to put forward a more socially acceptable self-image (Hays et al., 1989). The SDRS is comprised of five items, one such item is as follows: "No matter who I'm talking to,

I'm always a good listener". Each item was scored on a Likert scale ranging from 1 (*Definitely True*) to 5 (*Definitely False*) and the scale demonstrated acceptable internal consistency ($\alpha = 72$).

3.2.5.5. Social Comparison on SNSs. To assess participants' propensity to engage in social comparison on SNSs, two items were included in the questionnaire which were adapted from a study conducted by Vogel et al. (2014). asked: "When comparing yourself to others on Facebook, to what extent do you focus on people who are better off than you?" and "When comparing yourself to others on Facebook, to what extent do you focus on people who are worse off than you?" (1 *Not at All*; 5 *A Great Deal*).

3.2.6. Data Analysis

Using IBM Statistical Package for Social Sciences (SPSS) 20, descriptive statistics were run to illustrate the demographic characteristics of the sample and to elicit the intensity, frequency, duration and purpose of SNS use among participants, as well as the number and types of SNSs these teens were using. A hierarchical multiple regression was then conducted. General self-concept was the dependent variable in this analysis. Social desirability was entered into stage 1 of the regression to control for socially desirable responding. Variables that influence one's self-concept which have been discerned through previous research, including scholastic competence, social competence, athletic competence, physical appearance, job competence, romantic appeal, behavioural conduct and close friendships, were entered into the model in the second step. SNS intensity was then entered to assess whether it explained a statistically significant amount of variance in participants' general self-concept. The results of this regression demonstrated whether SNS intensity predicts adolescent self-concept. To explore whether there were underlying mechanisms through which this relationship was transmitted or to establish contingencies to this relationship, a series of conditional process analyses were conducted. Using the PROCESS macro for SPSS developed by Hayes (2013), mediational analyses were run to assess whether the participant attributes, listed above mediated the relationship between SNS intensity or duration and moderation analyses were run to test whether participants' SNS activities moderated this relationship. A mediation analysis was then conducted to determine whether this relationship was caused by social comparison. A one-way analysis of variance (ANOVA) was conducted to test the difference between actual, self-reported and parent-reported SNS usage.

3.3. Results

3.3.1. What is the Intensity of Adolescent SNS Usage?

Descriptive analyses indicated that 98% of participants had an SNS profile or account. Participants spent an average of 1 hour and 35 minutes using SNSs per day, according to the recording application installed on their devices. On average, participants had accounts with 5 SNSs platforms, the most popular of these being Snapchat (96.5%), Instagram (93%), and WhatsApp (81.4%) (see appendix I for further information on popular SNSs among the sample). The most commonly reported SNS activities included talking with friends and family (95.3%), finding entertaining content (73.3%) and feeling involved with what is going on with others (59.3%) (see appendix J for more details on participant SNS activities). On average, participants reported having approximately 857 friends and followers in total on their SNS platforms. According to participant responses, 84.9% use SNSs during their free time, 17% use SNSs during school, 25.6% use SNSs during social occasions and 2.3% use SNSs during mealtimes. 68.6% of participants check their SNSs before they get out of bed in the morning while 61.6% check their SNSs before they go to bed. The majority of participants (41.9%) reported accessing SNSs 10 or more times per day while the majority of participants (48.8%) posted on SNSs "every few months".

3.3.2. Is there a Discrepancy between Parent and Adolescent Estimations of their SNS Intensity and their Actual SNS Usage?

To investigate whether there was a significant difference between parent and adolescent estimations of their SNS intensity and their actual SNS usage, as measured by the recording application installed on participants' devices, a one-way between-groups ANOVA was conducted. To ensure this analysis was conducted reliably, the data was analysed to ensure it fulfilled the assumptions of a one-way, ANOVA. The dependent variable was continuous, while the independent variable consisted of three categorical groups: parent, adolescent and actual SNS usage. There was no relationship between the observations in each group or between the groups, demonstrating that this data met the assumption of independence of observations. The assumption of normality was evaluated and determined to be satisfied as the three groups were associated with a skew of .96 and kurtosis of .84 which is considered acceptable to prove normal univariate distribution (George & Mallery, 2010). The distribution of the data was also analysed using box and probability plots and histograms, which demonstrated symmetric distributions and equal spread. However, this analysis suggested the

presence of outliers in the data. One case was found to be an extreme outlier because it was more than three standard deviations from the mean. It was surmised that this outlier was due to incorrectly entered data and the outlier was eliminated. This exclusion did not change the results of the one-way ANOVA. Other, less extreme, outliers were within 1.5 standard deviations of the mean and were suspected of being legitimate and representative of the population. Further, the ANOVA was run with and without these outliers and the results remained the same. Therefore, less extreme outliers were included in this analysis as they did not influence the results. Furthermore, the assumption of homogeneity of variances was not violated based on Levene's F test, $F(2, 254) = .26$, $p = .77$. The recording application installed on participants' devices yielded the lowest durations of SNS use ($M = 1$ hr35 mins; $SD = 1$ hr 38 mins), followed by the parent-estimated duration of SNS use ($M = 2$ hrs38 mins; $SD = 1$ hr 31 mins), while adolescent estimations of the duration of their SNS use were highest ($M = 2$ hrs 58 mins; $SD = 1$ hr 36 mins). The one-way between-groups ANOVA demonstrated that there was a statistically significant difference between recording methods, $F(2, 254) = 17.47$, p < .001. The effect size, calculated using eta squared, was .12, indicating that the difference in mean scores between recording methods was large, according to Cohen (1988). To evaluate the nature of differences between the three means further, the statistically significant ANOVA was followed by posthoc comparisons using the Tukey's range test. This indicated that the mean score for the recording application's duration of SNS use (M = 1 hr35 mins, SD = 1 hr 38 mins) was significantly different from parent-estimated duration of SNS use (M =2 hrs 38 mins, $SD = 1$ hr 31 mins) and adolescent-estimated duration of SNS use ($M = 2$ hrs 58 mins, $SD = 1$ hr 36 mins). Parent and adolescent-estimated duration of SNS use did not significantly differ. The differences between parent-reported, adolescent-reported and actual SNS use are presented in figure 5.

3.3.3. How is Duration and Intensity of SNS Use Associated with Adolescent Self-Concept?

A hierarchical multiple regression was conducted to investigate whether SNS intensity and duration of SNS use would predict participants' general self-concept after controlling for the influence of social desirability, scholastic competence, social competence, athletic competence, physical appearance, job competence, romantic appeal, behavioural conduct and close friendships. First, the assumptions of a hierarchical multiple regression were tested. A sample size of 86 was regarded as

sufficient given nine independent variables were to be included in the analysis (Ferguson, 2009) (see Appendix K, for supporting information). The assumption of singularity was also fulfilled as the independent

Figure 5

Differences between Parent-Reported, Adolescent-Reported, and Actual SNS Usage
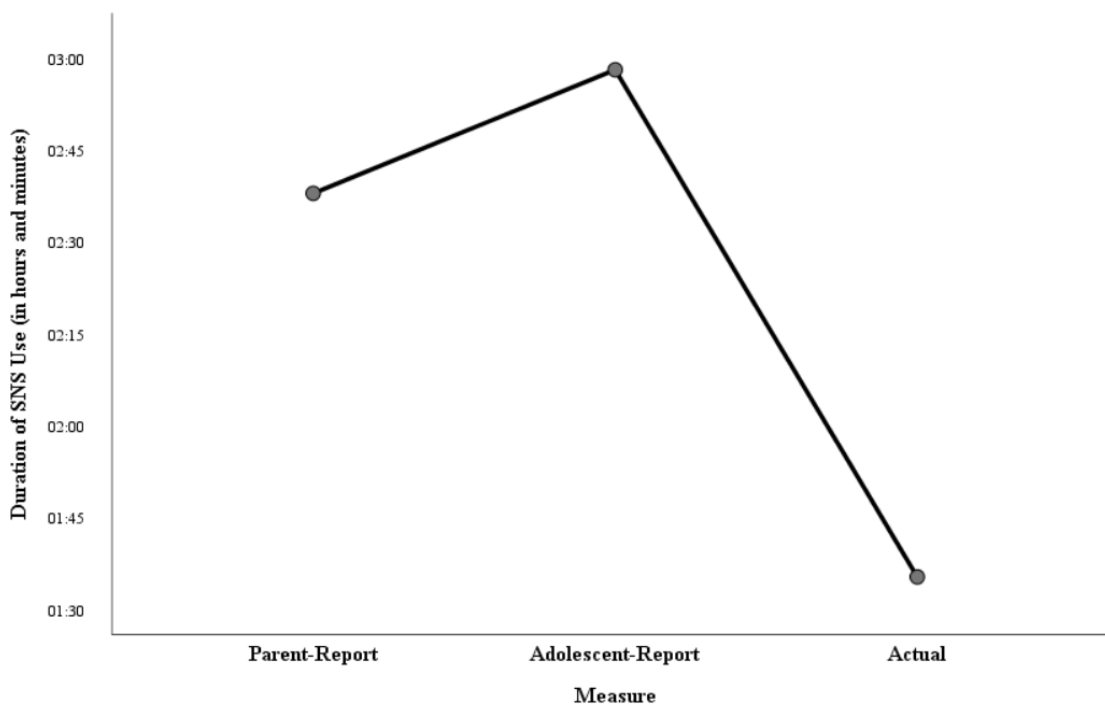
variables were not made up of other independent variables nor were they were strongly correlated (r ≥ .70), (please see Table 4). The Durbin-Watson statistic demonstrated that the values of the residuals were independent, as the obtained value was close to 2 (Durbin-Watson = 1.89), (see Appendix L). Collinearity statistics, including the tolerance and variance inflation factor, were within accepted limits; thus, the assumption of multicollinearity was satisfied (Hair, Black, Babin, Anderson, & Tatham, 1998) (see Appendix M). An examination of Cook's distance scores indicated no significant outliers (Cook, 1977) (see Appendix N). The assumptions of normality, linearity and homoscedasticity had not been violated, as determined by residual and scatter plots (Pallant, 2005) (see Appendix O). A three-stage hierarchical multiple regression was conducted with Global Self-Concept as the dependent variable. Social desirability was entered at Stage One of the regression to control for socially desirable responses. Next, scholastic competence, social competence, athletic competence, physical appearance, job competence, romantic appeal, behavioural conduct and close friendships were entered into Stage Two of the equation. SNS intensity and average duration of use, as discerned by the recording application installed on participants'

devices were entered thirdly. The hierarchical multiple regression revealed that at Stage One, Social Desirability, did not contribute significantly to the regression model, $F (1,90) = 4.05$, $p > .05$) and accounted for 0% of the variation in the model. After entering the nine domains of competency outlined above in Step 2, the total variance explained by the model was 62%, $F (8, 75) = 13.72$, $p < .001$. After controlling for socially desirable responding and the nine domains of competency outlined above, SNS intensity and duration of SNS use explained an additional 1% of the variance in participants' general self-concept; however, this change was not significant, $\Delta R^2 = .01$, $F (2, 73) = 1.20$, $p > .05$. This indicated that SNS intensity and duration were not significant predictors of variance in participants' general self-concept. Regression statistics are reported in Table 3 while intercorrelations between the multiple regression variables are reported in Table 4.

Table 3

Summary of Hierarchical Regression Analysis

Variable	B	t	sr^2	R	r^2	ΔR^2
Model 1				.01	.000	.000
Social Desirability	.01	.04	.01			
Model 2				.79	.62	.62
Social Desirability	-.01	-.06	-.01			
Scholastic Competence	.18	2.14*	.15			
Social Competence	.24	2.35*	.17			
Athletic Competence	.08	.99	.07			
Physical Appearance	.25	3.04**	.22			
Job Competence	.21	2.69**	.19			
Romantic Appeal	.06	.67	.05			
Behavioural Conduct	.23	2.70**	.19			
Close Friendships	.08	.88	.06			
Model 3				.80	.63	.01
Social Desirability	.01	.18	.01			
Scholastic Competence	.16	1.96	.14			
Social Competence	.25	2.40*	.17			
Athletic Competence	.10	1.26	.09			
Physical Appearance	.28	3.31**	.23			
Job Competence	.21	2.60**	.18			

Romantic Appeal	.04	.45	.03
Behavioural Conduct	.23	2.66**	.19
Close Friendships	.07	.72	.05
SNS Intensity	-.12	-1.48	-.10
Duration of SNS use	.00	.03	.00

Note. *p < .05, **p < .01

To explore whether there were underlying mechanisms through which the relationship between SNS intensity or duration of SNS use and adolescent self-concept was transmitted, a series of conditional process analyses were conducted using the PROCESS macro for SPSS developed by Hayes (2013). Firstly, participant attributes, including scholastic competence, social competence, athletic competence, physical appearance, job competence, romantic appeal, behavioural conduct and close friendships were considered as mediators of SNS intensity or duration and adolescent self-concept. Using Model 4 of the PROCESS macro, multiple mediational analyses were run to determine whether SNS intensity and/or duration of SNS use related to adolescent self-concept through one or more of these attributes. Bootstrapping with 5,000 resamples and 95% confidence intervals were employed, as recommended by Hayes (2013), when estimating indirect effects. However, these attributes did not significantly mediate the relationship between SNS intensity or duration and adolescent self-concept, indirectly (see appendix P).

Secondly, using Model 1 of the PROCESS macro and the bootstrapping and confidence intervals described above, multiple moderation analyses were executed to evaluate whether the relationship between SNS intensity and/or duration and adolescent self-concept was dependent upon participants' SNS activities. The results of these analyses indicated that participants' SNS activities did not moderate the relationship between SNS intensity or duration and adolescent self-concept (see appendix Q).

3.3.4. Was the Relationship between SNS Use and Adolescent Self-Concept Mediated by Social Comparison?

While the previous analyses demonstrated that the regression coefficient between SNS intensity or duration of SNS use and adolescent self-concept was insignificant, a mediation analysis, using PROCESS Model 4 (Hayes, 2013), based on 5000 bootstrapped samples and 95% confidence intervals, was performed to investigate whether social comparison mediated this relationship. Participants' general self-concept was entered as the dependent variable while SNS intensity and duration of SNS usage were entered as the independent variables. The final step involved entering participant

Table 4

Summary of Descriptive Statistics and Intercorrelations between the Multiple Regression Variables

	M (SD)	1	2	3	4	5	6	7	8	9	10	11	12
1. General Self-Concept	12.33 (3.73)	-											
2. Social Desirability	.59 (1.77)	.00	-										
3. Scholastic Competence	12.85 (3.26)	.44**	-.15	-									
4. Social Competence	12.28 (3.67)	.60**	-.09	.21	-								
5. Athletic Competence	14.08 (4.99)	.27*	-.14	.11	.25*	-							
6. Physical Appearance	15.46 (3.11)	.47**	.11	.28**	.29**	.11	-						
7. Job Competence	11.49 (3.44)	.42**	.03	.15	.39**	.20	.03	-					
8. Romantic Appeal	14.13 (3.91)	.42**	.07	.06	.53**	.34**	.39**	.25*	-				
9. Behavioural Conduct	11.61 (3.91)	.46**	.12	.40**	.24	.06	.16	.16	.00	-			.
10. Close Friendships	11.27 (3.97)	.48**	.01	.14	.60**	.11	.31**	.19	.43**	.31**	-		
11. SNS Intensity	27.01 (6.49)	-.10	.16	-.07	-.05	.12	.17	-.07	-.05	.02	-.08	-	
12. Duration of SNS Use	1:35 (1:38)	.01	.18	-.00	-.09	.05	-.00	.00	-.04	.24*	.05	.33**	-

Note. *p < .05; **p < .01

propensity to engage in social comparison into the equation. The results of this analysis indicated that upward social comparison was not a statistically significant mediator of the relationship between SNS intensity or duration of SNS use and adolescent self-concept (b = 0.07, 95% CI [-0.09, 0.06]).

3.4. Discussion

This study set out to establish the role of SNS usage in how adolescents define themselves to apply Shavelson et al.'s (1976) multidimensional model of self-concept to the 21st century. This study aimed to investigate the intensity of Irish adolescents' SNS use, differences between self-reported, parent-reported and actual duration of SNS usage, the relationship between SNS usage and adolescent self-concept and whether this relationship is mediated by adolescents' social comparison tendencies.

Firstly, the results of this study demonstrated that SNS usage is pervasive among Irish adolescents with 98% of teens using SNSs, for an average of 1 hour and 35 minutes per day. The most popular SNSs among Irish adolescents are Snapchat, Instagram and WhatsApp, while the most common activities were talking to friends and family, finding entertaining content and feeling involved in the lives of others. This study provided a detailed description of SNS usage of Irish 16-18-year olds, including the frequency, duration, intensity of SNS usage as well as the platforms they have accounts with and the activities in which they engage in. Before the current study, no other study had been published which provided insight into the SNS usage of this demographic and thus, little was known Irish adolescents' SNS usage, until now.

Secondly, adolescents and their parents overestimated the duration of their SNS usage. In recent years, the mass media have begun a campaign, which has been fuelled by pseudoscientific studies, such as the highly contentious study conducted by Twenge, Joiner, Rogers, and Martin (2018), in which SNSs are negatively portrayed as the source of societal ills, particularly mental health problems. This is reminiscent of controversy surrounding video games and violence and women's magazines and eating disorders which are nowadays widely accepted as myths (Boyd, 2014). The mass media shapes our belief systems and consequently, plays an important role in the development and transmission of prejudice, bias and fear (Happer & Philo, 2013). It is speculated that stigma of social media is spread by mass media, despite lack of proof, and that adolescents and their parents have internalised these negative portrayals of SNS use, causing them to overestimate their usage. It is also possible that parents and

adolescents and their parents have internalised these negative portrayals of SNS use, causing them to overestimate their usage. It is also possible that parents and adolescents are not distinguishing between SNS use and other smartphone activities, including surfing the web, using applications, gaming and entertainment services, inflating estimations of the duration of their use. This study's findings also contribute to the growing body of evidence which states that self-report measures of SNS use are unreliable (Scharkow, 2016; Valkenburg & Peter, 2011). Scharkow (2016) discerned that these measures are subject to under-reporting, but as was the case in the current study, more commonly over-reporting while Valkenburg and Peter (2011) suggested that these distortions may be a result of memory errors or social-desirability biases. This study not only highlighted that there is a statistical difference between self and/or parent-reported measures of SNS use and actual SNS use, but that this difference was large. This demonstrates that self and/or parent measures are vastly inaccurate representations of actual SNS use and calls into question the validity of studies that rely upon self and/or parent-report measures. It also highlights the importance of using client log data, such as an SNS use recording application installed on participants' devices because there is a large discrepancy between the current study and previous studies' findings on the duration of adolescent SNS usage. For example, Anderson and Jiang's (2018) found that 45% of adolescents are online "almost constantly" whereas the current study found that adolescents are using SNSs for a mere 6.7% of the day. This discrepancy is likely due to Anderson and Jiang's (2018) use of a self-report measure ranging from "almost constantly" to "less often" (p. 8) rather than a more accurate assessment of the duration of their SNS usage.

Finally, SNS intensity or duration of SNS use did not explain a statistically significant amount of variance in participants' self-concept after accounting for factors that affect one's self-concept, which have been discerned through decades of previous research, including academic, social and athletic competence and physical appearance. Therefore, the results of this study highlighted that SNS intensity and duration of SNS use and adolescent self-concept are unrelated, and adolescents' self-concepts are neither suppressed nor promoted by SNS use. Not only did a direct association not exist between these constructs, but this relationship was also not transmitted through underlying mechanisms, such as participant attributes, nor was it contingent upon participants' SNS activities. Moreover, the relationship between SNS usage and self-concept was not mediated by participants' propensity to engage in social comparison.

While evidence exists for a negative association between SNS usage and self-esteem (Andreassen et al., 2017; Błachnio et al., 2016; Blomfield Neira & Barber, 2014; Cingel & Olsen, 2018; Errasti et al., 2017; Hawi & Samaha, 2017; Kalpidou et al., 2011; Sherlock & Wagstaff, 2018; Woods & Scott, 2016), this study has demonstrated that the use of SNSs does not relate to adolescent self-concept. It is important to distinguish between these constructs when considering the current study's contribution. Self-concepts are cognitive assessments of our attributes, whereas self-esteem is our acceptance of these concepts of self and whether or not they are deemed important (Hattie, 2014). Distinctive from previous research that examined the relationship between SNS usage and how users evaluate their worth, this study set out to provide an understanding of the relationship between SNS usage and how adolescents define themselves. It is speculated that SNSs perpetuate societal values and social norms, as is the case with other media modalities, including radio, television and newspaper (Happer & Philo, 2013). SNS users then assimilate and use these values and norms to make judgements on whether their conceptions of the self are important, thus, making it possible for SNSs to relate to self-esteem and not self-concept. For example, if SNSs transmit the value that physical appearance is an important attribute and the user does not consider themselves physically attractive, this may lead to a decline in their self-esteem. However, it does not change their evaluation of themselves as physically unattractive.

Prior to conducting this study, there was a dearth of research investigating this relationship in adolescents, despite it being a critical period of self-concept development. In their seminal study, Appel et al. (2018) found a negative relationship between Facebook intensity and adolescent self-concept clarity and that Facebook intensity predicted a decline in young adults' self-concept clarity over time. However, it is important to recognise the conceptual separation between self-concept clarity and general self-concept. While general self-concept is our over-arching perception of who we are (Shavelson & Bolus, 1982), self-concept clarity is the extent to which one's self-concept is clear and consistent (Appel et al., 2018). Self-concept clarity is a structural feature of self-concept. Appel et al's (2018) study is silent on adolescents' general self-concept and its dimensions. Methodological differences between Appel et al.'s (2018) and the current study may have also contributed to the contrasting results. Appel et al.'s participants ranged in age from 14 to 48 whereas the participants in the current study were aged 16-18 years. Further, Appel et al.'s study merely considered Facebook use

and relied on self-report measures of SNS use, a practice that has been widely criticised (Scharkow, 2016; Valkenburg & Peter, 2011) and also may have accounted for the disparity of findings.

The findings of the current study are inconsistent with previous research which supported the fragmentation hypotheses (Appel et al., 2018), which states that "the ease with which possible identities can be crafted online may fragment adolescents' personalities" (Valkenburg & Peter, 2011, p. 123). While this study did not set out to shed light on the degree to which SNSs fragment adolescent identity, the fragmentation hypothesis was proposed to explain a negative association between SNS use and self-concept. However, this study has shown that SNS use and adolescent self-concept are unrelated, therefore, it does not provide support for the fragmentation hypothesis. Since its proposal, no evidence for the process of identity fragmentation as a cause of this relationship has been put forward. Researchers have merely commented on whether the relationship exists (Appel et al., 2018). Valkenburg and Peter (2011) appear to have put forward a hypothesis, without sufficient justification and without consideration of other processes which may have been at play, such as social comparison. As a result, Valkenburg and Peter's (2011) proposal remains a hypothesis and has not yet become a substantiated theory. In addition, the current study did not support the self-concept unity hypothesis, which posits that SNSs provide adolescents opportunities to express their identities and receive validation, enhancing their self-concept, in contrast to previous research (Valkenburg et al., 2017; Valkenburg & Peter, 2011; Valkenburg et al., 2006). It is often assumed that the pervasiveness of SNSs among adolescents will lead to radical changes in the development of their self-concept. However, it is likely the bio-psycho-social processes, including neurocognitive development, social comparison, increased societal expectations and puberty, which lead to the formation of the self, are still taking place similarly to previous generations but in a different context. Teens are faced with the same identity struggles online world as they are offline and self-concept development is neither helped nor hindered by SNSs. Thus, the current study refutes Valkenburg and Peter's (2011) fragmentation and self-concept unity hypotheses. They are regarded as far too reductionist for the complex web of factors that influence adolescent self-concept formation. As highlighted by Weinstein (2018, p. 3597) "the relationship between social technology usage and well-being—whether enhanced or degraded—is not confined to an "either/or" framework: the emotional see-saw of social media use is weighted by both positive and negative influences".

The results of the current study indicated that the relationship between SNS use and self-concept was not mediated by participant propensity to engage in social comparison, which is the innate drive to assess our attributes in comparison to others to fulfil our self-evaluation needs (Festinger, 1954). While evidence exists for social comparison as a possible mediator of the relationship between self-esteem and SNS use (Sherlock & Wagstaff, 2018; Vogel et al., 2014), this indirect pathway does not apply to the relationship between self-concept and SNS use. This disparity between the current findings and the findings of previous research may again be attributed to the differences between the constructs of self-concept and self-esteem. While social comparison does not mediate the relationship between SNS use and an adolescents' overarching self-perception (or self-concept), it may mediate the relationship between SNS use and how an adolescent evaluates their self-perception (also known as, self-esteem). This is likely because SNSs provide a platform to evaluate their self-perceptions, through social comparison processes, but evidently not to develop them. Self-concept is derived from much more than social comparison. According to Hattie (2014), confirmation and disconfirmation play an important role in self-concept development. Confirmation and disconfirmation of self-conceptions derive from a range of sources including invalidation or reinforcement from others via verbal and nonverbal messages, testing hypotheses of the self and rejection of information that differs from self-perceptions (Hattie, 2014). This study has demonstrated that social comparison on SNSs is not a mode of adolescent self-concept development.

In refute of initial hypotheses, SNS usage does not relate to adolescent self-concept. This indicates that SNSs are less deleterious than often alluded to not only in academia but also, in mainstream media. SNSs are often portrayed as precipitating increases in mental health problems globally despite evidence for its negative effects being sparse and that which does exist is based upon low-quality research (Keles, McCrae, & Grealish, 2019). A recurrent shortcoming of previous research has been the premature interpretation of correlational data as indicating that SNS use causes depression and anxiety among adolescents (Twenge, Joiner, Rogers, & Martin, 2018). However, it is speculated the condemnation of SNSs in academia has permeated into mainstream media and as a result, has been assimilated into vernacular discourse. Recently emerged longitudinal research has sought to challenge these claims and demonstrate the temporal order of this relationship. These studies indicated that adolescents who experience mental health problems, including depression and anxiety,

used SNSs more frequently (Heffer, Good, Daly, MacDonell, & Willoughby, 2019; Nesi, Miller, & Prinstein, 2017). Moreover, in Viner et al.'s (2019) longitudinal study, 13-16-year olds were interviewed about their SNS use and completed questionnaires on their well-being, physical activity, sleep adequacy and cyber-bullying. The researchers concluded that SNS use does not cause direct harm to adolescent well-being, unless it displaces sleep or physical activity or if they were exposed to cyberbullying (Viner et al., 2019). Furthermore, this rhetoric is overly focused upon the negative consequences of SNS use and rarely encompasses the benefits of SNSs, which have been discerned throughout previous research, including increased social support, reinforcement of real-world relationships, greater connectedness with others and an increased sense of belonging (Junghyun & Jong-Eun Roselyn, 2011; Nadkarni & Hofmann, 2012; Shapiro & Margolin, 2014). Thus, the moral panic being evoked by cross-sectional research and mainstream media scaremongering tactics may be unwarranted.

The current research has theoretical, practical and empirical implications. Historically, the theorisation of self-concept was fraught with controversy and dispute until Shavelson et al. conceptualised the multi-dimensional model of self-concept in 1976, for which there is now strong support. According to this model, self-concept is a multifaceted and hierarchically ordered structure, which becomes increasingly differentiated with age and is culturally specific. However, since its conceptualisation in 1976, it has not been updated to reflect the major cultural shift which has occurred throughout the previous 50 years, that is, the widespread integration of new media technologies into daily life. The behavioural changes associated with this technological revolution were hypothesised to relate to self-concept directly. An individual's overarching self-concept is inferred from an individual's interaction with and interpretation of their environment, which is represented pictorially in figure 1. The everyday experiences of adolescents at the bottom of the hierarchy are radically different from that of 50 years ago, with 98% accessing SNSs for an average of 1 hour and 35 minutes daily, according to the current study. However, while SNS use was hypothesised to relate to self-concept directly, this was disproven. The work of Valkenburg and Peter (2011) may help to explain why this was the case. They posit that the psychosocial problems which occur during SNS communications, including frustration resulting from romantic relationships, disappointing friendships, social exclusion, resemble those which occur in adolescents' offline lives. Valkenburg and Peter (2011) recommend that strategies aimed at curbing the potentially adverse

consequences of online communication be developed similar to those that have proven to be successful in solving the problems that adolescents encounter offline. Furthermore, it was hypothesised that SNS use may relate to adolescents' self-perception indirectly. According to the multidimensional model of self-concept, to reduce the vast quantity and complexity of experiences, an individual categorises them into sub-domains and that the system of sub-domains adopted by an individual is culturally dependent (Shavelson et al., 1976). As SNSs are deeply embedded into the cultural landscape of modern adolescence, it was expected that their system of categories would reflect this cultural change. However, SNS usage did not mediate changes to one's overarching self-concept indirectly, through these sub-domains. Thus, this hypothesis was also disproven. It is possible that other factors contribute to sub-domains of adolescent self-concept more so than SNS use and that collectively, these explain a greater quantity of the variance in ones' global self-concept. For example, it may be that adolescents' performance in a range of subject-areas contributes to their academic self-concept more than SNS use (Marsh, 1990b). Academic self-concept, in turn, mediates the relationship between their performance in a range of subject areas and general self-concept. Thus, Shavelon's multi-dimensional model provides a theoretical backdrop to understanding self-concept and is still as relevant today as it was in 1976, despite major technological advancements and cultural change.

Practically, this research provides parents, guardians and educators with the knowledge that SNS use is not related to adolescent self-concept. In 2018, the DES implemented a Wellbeing Policy and Framework for Practice which outlined that by 2023, every Irish school was required to adopt a preventative, evidence-informed, whole-school approach to well-being promotion. This document stated this preventative wellbeing promotion process should focus on enhancing school-based protective factors, one of these being "opportunities to develop the necessary skills to cope with using online technology in a safe and appropriate way" (DES, 2018, p. 12). NEPS plays a key role in building schools' capacities to do so, through the provision of systemic support and development work, consultation and training. It is important that when assisting principals in the development of these approaches and policies and when formalising training programmes, EPs critically review, synthesise and disseminate existing research, including the findings of the current study, to ensure that the practices of these stakeholders are evidence-informed. For example, many school principals have introduced a reduction or ban of SNSs and smartphone use on school premises while

some have forbidden the use of these technologies outside of school hours. EPs have an important role in providing principals, who are developing Wellbeing approaches and Acceptable Use policies, with research-informed guidance on the existing evidence for potential benefits of these technologies and the weakness of the evidence for adverse effects. Furthermore, the current research is informative to EPs when developing training for educators on Cyber Safety education programmes. It is important that these programmes are focused on educating adolescents on the safe and responsible use of SNSs without condemning its use, unjustifiably, and include information on sleep hygiene, physical activity and cyberbullying, as suggested by Viner et al. (2019). Moreover, in 2017, the ISPCC conducted a case review of its work relating to cyber issues, which identified Identity and Wellbeing as being one of the major concerns with regard to children's safety online. Despite the limitations of case study research, which include researcher bias and lack of generalisability of the findings, this document was incremental in the formulation of the GOI's Action Plan for Online Safety (2018a). It is argued that the CYP of Ireland would be better served if the GOI's Action Plan for Online Safety (2018a) was informed by the current study, taken together with previous research with a high quality of evidence.

Empirically, the current study informs future researchers of the limitations of using self-report measures of SNS use. This was one of the first studies to examine the relationship between SNS usage and general self-concept. This was also one of the first studies to examine this relationship in adolescents, despite it being a critical period of self-concept development and to account for self-attributes and type of SNS activity when measuring this relationship. Thus, the results of this study provide empirical insight into an area that was previously, relatively unexplored.

The strengths of the current study include its distinctive theoretical, practical and empirical contributions, as outlined above. It also boasted a robust methodology because it collected data from multiple sources (parents and adolescents) and it required participants to record the duration of SNS use in the last 7 days by accessing a recording application installed on their device. This allowed the researcher to collect accurate data on the duration of teens' SNS use. The questionnaire used consisted of systematically validated and reliable subscales. Not only this, but it was fully piloted with a convenience sample of adolescents, after which a focus group was facilitated. Several improvements were made to the questionnaire and study design following this. Moreover, the current study measured and statistically accounted for factors that

contribute to adolescents' general self-concept, including social competence and physical appearance.

However, the current study is not without its limitations. Firstly, this study employed a correlational cross-sectional design. Thus, the researcher could merely make inferences about the relationship between SNS usage and adolescent self-concept and not determine causality. Furthermore, this study used a web-based questionnaire to collect data from participants. A number of shortcomings are associated with using web-based questionnaires including self-selection bias, lack of information about non-respondents and unknown response rates. Self-selection bias, in particular, negatively affected the representativeness of the current study's sample. This is indicated by the preponderance of females who took part. This is reflective of a phenomenon highlighted throughout previous research that females are more likely to participate in online surveys than men (Smith, 2008). Smith (2008) attributes this to differences in how males and females make decisions and value actions in the online environment. This imbalance may have been further exacerbated by the cluster and snowball sampling techniques employed which were deemed necessary to increase participation rates. These shortcomings threaten the study's external validity and limits the extent to which the results can be applied to Irish 16-18-year olds. It also may also have skewed the results because previous research has demonstrated that females are more likely to engage in excessive SNS and be susceptible to negative psychological outcomes due to their motivations for using SNSs, including social comparison and self-validation (Andreassen et al., 2017; Blomfield Neira & Barber, 2014; Sherlock & Wagstaff, 2018).

A replication of this study is warranted with a clinical sample of adolescents because it has been established that adolescents with mental health problems are more likely to use SNSs maladaptively (Heffer, Good, Daly, MacDonell, & Willoughby, 2019; Nesi, Miller, & Prinstein, 2017). Providing insight as to how the maladaptive use of SNSs in clinical samples relates to their developing sense of self would be a promising research avenue. Further longitudinal and experimental research examining the causal effects of SNS use on adolescent well-being is required to resolve the debate in this area. Moreover, Viner et al. (2019) opened an interesting line of inquiry when he uncovered that poor sleep quality and sedentary behaviours explained the link between SNS use and adolescent well-being, however further longitudinal and experimental research is required to corroborate their findings. Their study also showed that exposure to cyberbullying was detrimental to adolescent wellbeing. Though cyberbullying was

outside the scope of the current study, future research is required to provide insight into its relationship to adolescent self-concept. In their longitudinal study, Valkenburg et al. (2017) discerned that adolescents with high levels of social self-concept showed an increase in SNS use in subsequent years, and that SNS use resulted in small improvements in social self-concept. They referred to this as the-rich-get-richer hypothesis. Future research should endeavour to ascertain whether this process applies to adolescents' general self-concept. Lastly, this study highlights the importance of using of screen-time applications to measure the duration of SNS use in future research because self and parent-report measures are subject to over-reporting, which has substantial consequences when interpreting results reliably. Due to advancements in technology, this data is easily collected because most smartphones already have screen-time applications installed. However, as research methodology evolves in response to technological advancements, so too must the ethical responsibilities of researchers. It will be important for future researchers to adhere to ethical standards, including safeguarding participant privacy, ensuring data security and implementing transparency during the informed consent process, when asking participants to install SNS usage monitoring applications on their devices.

3.4.1. Conclusion

The current study set out to provide an understanding of present-day adolescents' self-concept development in a networked era because SNSs appeared to provide them with optimal conditions to explore and establish who they are. In doing so, several myths were debunked, but new insights were provided that enrich our knowledge on this issue. While the use of SNSs has become firmly embedded in the lives of Irish adolescents, usage neither suppresses nor promotes typically developing adolescents' self-concept. This study argues for discussion regarding SNS and mental health to move beyond the portrayal of SNSs as a scourge on society towards acceptance that new media technologies are pervasive among this generation. Thus, the next wave of research should focus on the susceptibility of adolescents with mental health problems online and the factors which mediate the association between SNS usage and adolescent well-being.

Chapter 4 - Critical Review Paper

The critical review paper begins by providing an account of the process of research development and the epistemological position adopted by the researcher as well as a rationale for methodology selection. This paper then transitions to a critical appraisal of the current study and reflections upon ethical and methodological challenges before expanding upon the distinctive contribution of this study. The study's distinctive contribution is then summarised in the impact statement.

4.1. The Process of Research Development

Throughout my lifespan, I have witnessed an era of rapid technological advancement and I have been fascinated as to what effect this has been having upon adolescent and child development. When choosing a research topic to fulfil the requirements of the Doctorate in Child and Educational Psychology (DECPSY), I gravitated towards the topic of adolescent mental health as it was an issue that I was passionate about promoting. Gaps which emerged from a review of existing literature included; an absence of robust causal research regarding the impact of social media on adolescent mental health, the extent of SNS usage among Irish adolescents, Irish adolescents subjective experiences of SNSs and the role of perceived anonymity in predicting online harassment and cyberbullying.

I then began to devise designs that would address the above gaps. I considered employing an experimental design whereby adolescents would be randomly allocated to a limited SNS use intervention group and a waitlist control group to investigate the effect of SNS use on adolescent wellbeing. I also considered using an experimental design to explore the role of perceived anonymity in cyberbullying whereby adolescents would be asked to provide online, anonymous ratings on photographs of an actor's appearance followed by face-to-face ratings of the actor's appearance. However, whilst drafting my research plan, I became aware that these designs posed numerous ethical dilemmas. The first design involved implementing a limited SNS usage intervention, when benefits of using SNSs had been discerned and negative consequences are based on methodologically inadequate studies, which had the potential to cause harm to participants. The second design involved a degree of deception. Other ethical issues that arose were the limits of confidentiality and the use of vulnerable research participants (under the age of 18). In consultation with the DECPSY team, I decided that the risks outlined above outweighed the benefits and began to re-consider the design of the proposed study. During a one-to-one tutorial, a tutor directed me to a research gap in

this area, which was SNS use and adolescent identity and self-concept. When I conducted a review of the literature to uncover the extent that this construct had been examined, I found that this area was in an early stage of empirical investigation. This gap also fulfilled several of the necessary characteristics which I had been searching for: clear objectives could be derived; it satisfied my interests; it adhered to ethical principles and solving this problem was worthwhile and important to the field of Educational and Child Psychology. Thus, the identification of an area to investigate as part of my thesis research was not a difficult process; however, I was faced with many challenges when refining and transforming it into a research plan.

4.2. Epistemological Position Adopted

My review paper concluded that an investigation of the relationship between global self-concept and adolescent SNS usage was warranted, forming the basis for my empirical paper. Once the central aim of the study had been identified, a paradigm was selected to bridge the aims of the study to methods of achieving them. The current inquiry adopted a pragmatic epistemological perspective. Pragmatism is a school of thought that emerged from the writings of three philosophers: Charles Sanders Peirce, William James and John Dewey (Biesta & Burbules, 2006). It has been defined by Tashakkori and Teddlie (2003, p. 713) as:

> a deconstructive paradigm that debunks concepts such as "truth" and "reality" and focuses instead on "what works" as the truth regarding the research questions under investigation. Pragmatism rejects the either/or choices associated with the paradigm wars, advocates for the use of mixed methods in research and acknowledges that the values of the researcher play a large role in interpretation of results.

Pragmatism has been hailed as the most prudent and practical approach to answer a given research question and affords several advantages for the researcher, including granting the researcher autonomy and freedom from methodological distinctions when designing a study so that they may make an informed decision as to the best way to answer the research question (Clarke & Visser, 2019). This, in turn, reduces biases of the set of methodological rules enforced by philosophical dogmatisms of positivism and constructivism and improves the quality and depth' of the research undertaken. This approach encourages researchers to approach data analysis with greater sensitivity while also promoting reflexivity and reflection on the actions taken and choices made.

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Pragmatism views individual experience, habits and patterns of behaviour in ethical conduct as the mediator between value and justified action (Heilinger, 2019). Thus, as a pragmatic researcher, it was important for me to make my personal values explicit and consider their implications for my ethical conduct. Throughout previous experience working with vulnerable CYP in a broad range of settings, including those from different cultural, faith and ethnic groups and socio-economically disadvantaged backgrounds, I developed a set of personal values. Not only had these values been ingrained in me through previous experience, but the DECPSY team also provided instruction in and required students to conform to ethical codes of practice, as set out by the Psychology Society of Ireland (PSI) (2010) and the Department of Children and Youth Affairs (DCYA) (2017, 2018). These were developed further through engagement with professional practice. According to pragmatism, ethical conduct is not simply the application of fixed and presupposed principals but is instead a dynamic process which involves creatively responding to a continuously changing reality and thus, all ethical dilemmas need to be treated in response to their specificities (Inguaggiato, Metselaar, Porz, & Widdershoven, 2019). Thus, when an ethical dilemma arose, such as that described in section 4.5.1, it was important for me to integrate previously acquired knowledge and experience as well as pertinent research and theory to devise the solution.

From an ontological perspective, pragmatists accept intersubjectivity, that is that individuals have unique interpretations of that world, as a key element of social life and take the view that endless discussion and debate on the nature of reality detracts from the value of a study's results (Mertens, 2014). This is true of the current study which emphasises its distinctive contribution to the field of educational and child psychology and theoretical, empirical and practical implications it provides to researchers, educators, parents, psychologists and policymakers alike.

Epistemologically, pragmatism asserts that research is situated in communities. Thus, according to pragmatism, research is best conducted when the researcher endeavours to engage with a range of community members to learn about their understanding of the phenomenon under investigation (Hall, 2013). This reciprocally promotes the researchers' understanding of the problem, which then informs appropriate action when designing the study methodology and allows for the problem to be addressed (Maxcy, 2003). This is achieved by taking measures to decrease the distance between the researcher and the researched. The integration of this core tenant of

pragmatism into my research was illustrated on multiple occasions. For example, during the conduction of the pre-pilot and pilot study, when I liaised with secondary school principals and EPs while collecting data and when I decided to include parental measures of their adolescents' online behaviour.

Methodologically, Mertens (2014) asserts that qualitative, quantitative or mixed methods are compatible with the pragmatic paradigm, though mixed methods are often most associated with pragmatism. However, pragmatism allows the researchers to choose the methods (or combination of methods) that work best for answering their research questions, which is the course of action I carried out as demonstrated in the following section, entitled "Rationale for Methodology Selection".

In summary, as a scientist-practitioner in training, adopting a pragmatic approach allowed me to adapt the research to address the context and the dearth of research in the area as well as attuning the methodology to the participants' needs. It also promoted my autonomy, which allowed me to focus on how best to answer the research question and continuously question and reflect upon actions and decisions made; how they impacted the data collected and how they aligned with the aims of my research. As a result, the process of formulating the research methodology was reflexive and iterative, with each adjustment leading to more refinement.

4.3. Rationale for Methodology Selection
4.3.1. Design

As previously mentioned, the adoption of an experimental approach to examine the effect of SNSs on adolescent self-concept was considered, to establish causality between these variables. The experimental design considered was the implementation of a limited SNS use intervention such as that in employed in a study conducted by Hunt, Young, Marx, and Lipson (2018), whereby they randomly assigned participants to limit SNS use or to use SNSs as usual for three weeks. Pragmatically, the implementation of this intervention would have presented several methodological challenges. Firstly, incentivising adolescent participation would have been difficult given that SNS use is prevalent among them. Secondly, monitoring the SNS usage of participants in the intervention group to ensure fidelity would have proved challenging. Thirdly, it was derived from the literature review that this area was under-explored. While the processes that promote or inhibit adolescent self-concept development had been alluded to in previous research, it was not yet known whether these variables were associated.

Moreover, several benefits of SNSs have been established including enhanced social support, greater connectedness with others and an increased sense of belonging. Also, previous research was not methodologically robust enough to conclude that SNS use has a deleterious effect on adolescent mental health (Keles et al., 2019). Thus, the implementation of an experimental design to examine the effect of SNSs on adolescent self-concept would have been unethical because the reduction or removal of an activity, of which benefits have been associated and negative consequences have not been sufficiently evidenced, had the potential to cause participants maleficence.

Given the paucity of the research in this area and the ethical and practical implications of implementing an experimental design, this study set out to adopt a descriptive rather than an analytical design. Within descriptive research, it is possible to employ either a cross-sectional or qualitative methodology. At first, I considered employing mixed methods. This would have not only allowed me to demonstrate whether SNS use predicted adolescent self-concept but also answer exploratory questions about how and why that predicted relationship happens, thereby verifying and generating theory, corroborating findings across methods, clarifying the findings from one method and expanding the depth and breadth of findings (Teddlie & Tashakkori, 2009). This consideration was explored at my first supervision meeting with my research supervisors. It was collaboratively decided that this approach would increase the complexity of an already complex investigation. Self-concept is a complex, hierarchical, multi-faceted construct and to investigate it comprehensively using both quantitative and qualitative methods would be challenging within the confines of the three-year professional doctorate. The resources required for data collection, management and analysis would also have been greater if I implemented a mixed-methods design (Halcomb & Andrew, 2009).

Having excluded mixed-methods methodology, I then needed to decide whether I was to employ a cross-sectional or qualitative design. My initial, specific design proposal of mixed methodology had been sequential explanatory, weighted towards quantitative methods. This was because I believed that given the state of the evidence in the area, that objective answers needed to be drawn with regards to whether SNS usage and adolescent self-concept were related. If it was concluded that these constructs were indeed related, it would warrant future qualitative research to uncover how they were related. However, first, the question needed to be answered objectively, thus requiring a quantitative, cross-sectional design.

4.3.2. Participants

Adolescence is a critical period of psychosocial development and I wished to examine whether networked adolescents' overarching self-perceptions were particularly vulnerable online, due to the social, psychological and neurological changes they were experiencing during that period. Moreover, participants' age range of 16-18 was selected based on the following three rationalizations. Firstly, Erikson (1968) demarcated that the "fidelity: identity vs. role confusion" stage of psychosocial development, during which adolescents undergo a period of exploring and establishing their own identity, occurs from the ages of 12-18. Secondly, as of May 2018, the age of digital consent of children, which is the age below which a person cannot by law make an agreement with an online service provider, in Ireland was set at 16 years, according to Section 31 of the Irish Data Protection Act (GOI, 2018b). Thus, asking participants to divulge information regarding potentially illicit activities posed an ethical dilemma. Finally, as discussed in the review and empirical paper, the stability of ones' general self-concept decreases significantly in early adolescence and increases throughout later adolescence and emerging adulthood (Protinsky & Farrier, 1980; Shapka & Keating, 2005). Due to the disparity between self-concept stability in early and later adolescence, it would be expected that the self-concept related data collected would not have been evenly distributed, which is one of the key assumptions of a hierarchical multiple regression. Thus, the results of the hierarchical multiple regression would not have been reliable.

4.3.3. Measures

When choosing a scale to measure SNS engagement, a systematic review of the psychometric properties of existing scales proved informative (Sigerson & Cheng, 2018). It was this review that demonstrated the psychometric robustness of the FBIS, which measures active Facebook use, emotional connection to Facebook, and integration of Facebook into daily life (Ellison et al., 2007). I had previously observed that this scale was widely used throughout the literature in this area. Sigerson and Cheng's (2018) systematic review guided me to Salehan and Negahban's (2013) adaptation of the FBIS, known as the SNIS. The SNIS demonstrated acceptable discriminant validity, convergent validity and construct reliability in their study (Salehan & Negahban, 2013) and thus, it was decided that I would include this scale to measure the intensity of participant's SNS use.

The current study was theoretically formulated using Shavelson et al.'s (1976) model because of its overwhelming empirical support. Thus, it was necessary for the instrument used to measure self-concept to be aligned with this theoretical perspective. Thus, the Coopersmith Self-Esteem Inventory (1967) and the Piers-Harris Self-Concept Scale (1969) were excluded from the selection process because they were formulated using a uni-dimensional, single score approach. Also, the scale would have to have been designed to measure adolescent self-concept specifically. Moreover, because previous research had failed to measure and statistically adjust for confounding variables, the scale had to measure variables that contribute to the formation of self-concept, including academic competence, social competence, athletic competence and physical appearance. However, it was critical that the global self-concept score was not the sum of the domain-specific scores, and that global self-concept was rated by its own set of items and scored separately. The scale had to be of reasonable length because it was believed that I would be disseminating the questionnaire in secondary schools and I was ethically obligated to avoid major disturbance to students' tuition, particularly because they were senior cycle students. I also needed to assure principals of this, to gain their cooperation. Eventually, I identified a scale that met each of the above criteria, the Self-Description Questionnaire II (SDQ-II) short-form (Marsh, Ellis, Parada, Richards, & Heubeck, 2005). However, before conducting the pilot study, a pre-pilot of the questionnaire was conducted with a 16-year-old known to the researcher. She was interviewed following questionnaire completion. She reported that the items of the SDQ-II short-form were too intrusive, and she felt uneasy responding to the items, despite knowing the researcher. When brought to my attention, I reviewed the item content and understood her comments, particularly on items such as: "I have a nice-looking face" and "I do not like my parents very much". I then learned of Harter's (2012b) Self-Description Questionnaire which not only fulfilled the aforementioned criteria, but it also included the additional advantage of a "structured alternative format" (Harter, 1982, p. 89). This format offset the tendency of participants to give socially desirable responses, provided respondents with enough latitude to qualify their choices and was overall, much less likely to cause participants discomfort.

4.3.4. Procedure

To access 16-18-year olds, it was initially decided that I would contact secondary school principals by phone and email and ask their permission to distribute a paper and pencil copy of the questionnaire to Senior Cycle students. Following this, I

would visit the participating secondary school and provide Senior Cycle students with a sealed envelope containing a parental information letter and consent form. They would also be informed that I would return 1 week later, to collect the parental consent forms, provide them with information about the study and disseminate the questionnaire to those who consented to participate. This procedure was executed when I conducted the pilot study, however, the return of parental consent forms was low, with a mere 38% of participants returning them. This was problematic and it was highlighted that measures would have to be implemented to improve this at a progress review panel.

Moreover, members of the DECPSYC team flagged the shortcomings of using a self-report measure of SNS use. Thus, I began to devise solutions to this problem and one of the most feasible methods of doing so was to provide participants with an SNS use recording sheet which would be collected 1-week post questionnaire completion. However, this method had its disadvantages. I was concerned that similar to the parental consent forms, there would be a low return rate of SNS use recording sheets. The members of the progress review panel also highlighted that the inclusion of a measure of actual SNS duration was incremental to the study. Thus, following the pilot study and progress review panel, it became apparent that my study design had two shortcomings which required addressing: low parental consent form return rates and the inclusion of a measure of actual SNS usage.

During supervision, it was suggested that I consider disseminating my research online to improve parental response rates. I decided to proceed with online questionnaire dissemination because not only were the alternatives wrought with limitations, but I also recognised that this would resolve the two shortcomings of my design concurrently. If I disseminated the questionnaire online not only would I be able to increase parental engagement but it would also enable me to request participants to access the recording application installed on their device and record the duration of the SNS usage in the previous 7 days, in the space provided.

Following this, the design of the study was amended. Parents accessed the online questionnaire and were provided with information regarding the study. They then ticked a box if they consented to participate and completed a short parental questionnaire regarding the intensity of their teens' social media usage. Subsequently, they received information as to what would be involved for their teen if they allowed them to participate and checked a box if they consented for their teen to participate.

They then gave the device to their child who was given information regarding the study, asked to give their consent to participate and completed the questionnaire.

4.4. Critical Appraisal of Current Research

To illustrate the strengths and limitations of the current study, it was decided that I would critically appraise it using the same criteria to which I subjected the 17 studies included in my literature review to. These criteria were governed by Gough's (2007) WoE framework, which includes appraisals of a study's: methodological quality, methodological relevance and topic relevance. These dimensions were informed by the quality indicators for correlational research developed by Thompson, Diamond, McWilliam, Snyder, and Snyder (2005), the Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies (NIH, 2014), as well as criteria designed by the author. WoE D, an indicator of the study's overall weighting, was then calculated by obtaining the mean scores for WoE A, WoE B and WoE C. A summary of the WoE ratings for the current study is shown below, in table 5.

Table 5

Summary of the WoE Ratings

WoE	Rating	Classification
Methodological Quality (WoE A)	2.7	Strong
Methodological Relevance (WoE B)	2.2	Promising
Topic Relevance (WoE C)	3.0	Strong
Overall Weight of Evidence (WoE D)	2.6	Strong

4.4.1. Methodological Quality

The current research received a strong rating in relation to WoE A, which is an assessment of the quality of execution of the study. Firstly, the sample size was justified using an a priori power analysis, using the statistical software design by Faul, Erdfelder, Lang, and Buchner (2007). The reliability coefficient was reported for all instruments based on data in hand and on average. They produce a reliability coefficient of $\alpha = .75$. The validity of measures was not empirically evaluated based on data generated within the study but instead inducted from the pilot study and test manuals. Furthermore, the current study demonstrated the methodological strength of collecting data using

multiple methods and sources. In total, the study collected data using three methods and sources: adolescent self-report, parent-report and an SNS use measurement application. Effect sizes were reported for primary and secondary outcomes. An additional methodological strength of the current study was that it measured and statistically adjusted for confounding variables that contribute to adolescent self-concept including scholastic competence, social competence, athletic competence, physical appearance, job competence, romantic appeal, behavioural conduct and close friendships. A measure of participants' tendency to engage in socially desirable responding was also taken. Methodologically, the current study's limitations include that on average, the internal consistency of its scales is acceptable, though not excellent (George & Mallery, 2010) and that it did not assess the included scales validities, merely referred to previous validation studies. However, these limitations were far outweighed by its strengths including sample size, reliability and effect size reporting, use of multiple measures and sources of data and measurement and control of confounding variables, resulting in a high rating for WoE A.

4.4.2. Methodological Relevance

This study obtained a medium score in terms of the appropriateness of its design for answering the research question. Firstly, the current study employed a cross-sectional design. While this design is suited to answering the research question, it did not allow the researcher to establish causality, which is a major limitation but is believed to be justified by the ethical constraints described in section 4.3.1. Another limitation of this study's methodological relevance was that while it set out to employ cluster random sampling techniques, the researcher responding reflexively to low participation rates by employing convenience and snowball sampling techniques. The rationalisation for this decision is discussed further in section 4.5.1. However, the implementation of such techniques is disadvantageous because it limits the representativeness of the sample. A further shortcoming of the current study was that the gender of participants was not evenly distributed. Sixty-nine percent of the sample utilised in this study was female. This is reflective of a phenomenon highlighted throughout previous research that females are more likely to participate in online surveys than men (Smith, 2008). Smith (2008) attributes this to differences in how males and females make decisions and value actions in the online environment. This also has implications for the representativeness of the sample. Methodological relevance strengths included that this study clearly defined participants' demographic information

including age range, mean age and gender of participants. Furthermore, this study presented findings for each of the primary and secondary measures and used standardised instruments to measure each variable. While the current study demonstrates strengths in relation to the appropriateness of its design for addressing the research questions, it is not without its limitations and therefore, its methodological relevance is deemed as promising.

4.4.3. Topic Relevance

In relation to the suitability of this study's content for answering the research question, it received a high score. Firstly, it measured participants' general SNS usage (intensity, frequency or investment) as opposed to previous research which focused on specific SNS use, such as Instagram and Facebook. Moreover, the current study measured participants' general self-concept as well as specific domains of self-concept, including social or academic self-concepts. Additionally, this study's sample consisted of adolescents aged 16-18 because this is a critical period of self-concept formation. Thus, using these three criteria set out by the researcher, the relevance of the content of this study for answering the research question was considered to be strong.

4.4.4. Overall Weight of Evidence

In conclusion, the current study demonstrates weaknesses in terms of its methodological quality, including the internal consistency of scales and reporting of scale validity. Also, shortcomings were apparent concerning its methodological relevance, including employment of a cross-sectional design, use on non-random sampling techniques and gender imbalance. However, the study's strengths, including sample size, reliability and effect size reporting, use of multiple measures and sources of data, measurement and control of confounding variables, the inclusion of demographic information, the use of standardised instruments and the relevance of the focus of this study, overshadow these limitations.

As a result, the current study obtained a high Overall Weight of Evidence score demonstrating that it offers a strong contribution of evidence to answering the research questions. Carrying out this critical review was beneficial because it illustrated that the researcher critically reviewed previous literature, synthesised its shortcomings and integrated this learning into the current study. As a result, this study had strong methodological robustness and yielded high topical relevance. However, this critical synthesis has its limitations. The use of a critical appraisal framework designed by the

researcher, though heavily informed by the works of Gough (2007); NIH, 2014 and Thompson et al., 2005, may have led to bias and inflation of scores, particularly when assessing this study under the criteria in WoE C because these were exclusively designed by the researcher. However, this study's high scores in WoE C reflect its distinctive contribution in that it is one of the first studies to investigate the relationship between 1.) non-specific SNSs and 2.) general self-concept and 3.) in adolescents.

4.5. Reflections upon Ethical and Methodological Challenges

Throughout the execution of the current study, numerous ethical and methodological challenges arose. Below, I reflect on the most prominent challenges in each area using the Reflective Practice Cycle (Rolfe, Freshwater, & Jasper, 2001) which poses the following questions: "What?", "So What?" and "Now What?". The purpose of this reflective process was to provide insight into the development of my research skills.

4.5.1. Ethical Challenges

What? The greatest ethical challenge I faced was in relation to obtaining parental consent following the decision to disseminate my questionnaire online. The DCYA (2018) sets out that parent/guardian consent is required for research participants under the age of 18. Literature was reviewed to gain insight into procedures for obtaining parental consent practiced by other researchers using this methodology. These procedures included the use of hard copies, electronic signatures or scanned and emailed forms. The first method was deemed counterintuitive because the researcher had changed the design of the study due to the low return of hard copies of parental consent forms. It was believed that the other methods listed above would hamper parents' propensity to give consent for their child to participate. The lack of feasibility of these procedures led to the researcher devising an alternative whereby school principals were contacted and informed of the study. If they agreed to participate, they shared a password protected hyperlink to questionnaire on their school's website. The school principals then texted and/or emailed parents to alert them to the questionnaire. The text message or email also contained the password needed to access the questionnaire. Parents then accessed the questionnaire, entered the password, were provided with an information sheet and were asked to tick a box if they consented for their 16-18-year-old to participate. This ensured that the participants did not complete the questionnaire, without their parents' consent.

So What? While parental consent is an important precaution to protect CYP from harm, when it is too stringent, it prevents CYP under the age of 18 from participating in research (Kennan, 2015). This is incongruous with the widespread consensus that CYP should have their say in decisions that affect them. For example, the United Nations (UN) Convention on the Rights of the Child (1989) states that children have the right to have their opinions taken into account and their views respected in decisions that affect them (UN, 1989). Moreover, the DCYA (2015) published the National Strategy on Children and Young People's Participation in Decision-making, which highlighted their commitment to promoting CYP's participation in research. However, this is jeopardised when institutional review boards require written consent from parents or guardians (Skelton, 2008). This practice excludes CYP from participating in research, even when such research aims to instigate positive change for CYP and society generally, and thus, raises the question: Is such an exclusion ethical? Ireland's policymakers have adopted a stringent approach to parental consent in all circumstances up to the age of 18, however, there is no law governing the issue (DCYA, 2018). More flexible approaches have been adopted in other countries such as parental consent not being required once a child reaches the prescribed age or provision being made for a waiver (Kennan, 2015).

Now what? Recent technological advancements have meant researchers have had to become more creative in discerning methodological opportunities in this evolving landscape. Research is increasingly being conducted through media, necessitating new ethical and methodological theorisation. This theorisation originates most effectively from researchers themselves because it is grounded in their situated practice. However, researchers and institutional review boards alike need to consider an innovative alternative such as that described above when gaining parental consent to prevent CYP from being excluded from participating in research. Lastly, this experience encouraged me to go beyond simply implementing policy documents and ethical codes and guidelines and begin to, initiate dialogue and raise awareness about striking balance protection of the CYP from maleficence and enabling their participation in research.

4.5.2. Methodological Challenges

What? When I began data collection, I employed random sampling techniques that involved obtaining a list of secondary schools in Ireland and assigning them a number. A random number generator was used to select schools to contact. It was set out in my research plan that this method of cluster random sampling would be

continued until the necessary number of participants had been obtained. However, when contacting principals via phone it was a frequent occurrence that they were unavailable or when contacting principals via email, often, no response was received. Despite this, many schools agreed to participate. However, participation rates, which were carefully monitored by the researcher were poor. The researcher continued to lobby school principals and though response rates increased at a slow rate, they remained low.

So What? I understood that significant action would be required to resolve this issue and begun to delve into literature on the topic and scheduled a meeting with my research supervisors for guidance. Firstly, an article that greatly informed my problem-solving in this area was written by Van Mol (2017). He advised that the use of a reminder text/email greatly increased online questionnaire response rates. When discussing this issue with my supervisors, we determined that I had adopted a "quantity over quality" approach of data collection, whereby I had been attempting to get as many schools as possible to participate when I should have been attempting to increase participation rates within participating schools. Collaboratively, it was decided that to increase participation rates in participating schools, posters would be hung, flyers would be sent to parents, announcements would be made by principals at school plays, parent evenings and assemblies and reminder texts/emails would be sent to parents. This improved participation rates to an extent. However, a sufficient number of participants had not yet been gained. To increase participation rates further, I considered utilising non-probability sampling techniques, such as convenience and snowball sampling. Though the use of non-probability sampling techniques would decrease the level of generalisability of the study's results, without them, the sample size would have been too small, decreasing the statistical power of the results and increasing the chances of falsely rejecting a true null hypothesis. The advantages and disadvantages associated with these sampling techniques were carefully weighed before deciding to proceed with them. Convenience sampling techniques involved asking post-primary school teachers, known to the researcher, to share the study information with their principal. Where snowball sampling techniques were employed, participating post-primary school principals were asked to recruit other post-primary principals, known to them.

Now what? Methodological challenges frequently arise when conducting research; however, it is important not to rely upon an indiscriminate application of an ineffective method. Instead, this process highlighted the importance of reflexive practice, which involves the researcher taking a step back from action, hypothesizing

about what is taking place, and stepping back more informed as to the appropriate course of action (Attia & Edge, 2017). In this way, the research and researcher were reciprocally and bi-directionally moulded. I achieved this through observation, reflection and engagement with my supervisors. This not only facilitated my learning and progress as a researcher but improved the methodology and prevented it from failing.

4.6. The Distinctive Contribution of this Study

I will now take the opportunity to expand on the theoretical, empirical and pragmatic implications of the current research, which were discussed briefly in section 3.4.

4.6.1. Theoretical Implications

Shavelson and his colleagues conceived the multi-dimensional model of self-concept in 1976. The current study proposed a revision of Shavelson et al.'s (1976) model because rapid advancements in technology have transformed society since then. One of the central tenets of the multi-dimensional model of self-concept asserts that "an individual's experiences, in all their great diversity, constitute the data on which he bases his perceptions of himself" (Shavelson et al., 1976, p. 411). This is demonstrated in figure 1, whereby an individual's experiences are at the bottom of the hierarchy. While one's general self-concept is relatively stable as one descends the hierarchy, the sub-areas of self-concept are more susceptible to change. Encountering many experiences that are inconsistent with their general self-concept would inevitably change their self-concept. It was expected that because today's teens are online almost constantly (Anderson & Jiang, 2018), their experiences at the bottom of the hierarchy would be radically different from adolescents 50 years ago and this would lead to significant changes in their general self-concept. However, this hypothesis was disproven. It is speculated that perhaps modern-day adolescents are engaging in the same processes of self-concept formation but in an online setting (Valkenburg & Peter, 2011) or that these experiences are not leading to significant changes in their self-concept because they are so deeply entrenched in their daily lives. Thus, they are not receiving information that disconfirms their self-concept and it remains relatively stable over time. It was also believed that this model needed to be updated because another central principle of Shavelson et al's (1976) theory is that our self-perceptions are composed of categories (including social, academic and athletic) and the category systems that we adopt reflect our culture. It was believed that the category systems of

modern-day teens were different from that of teens 50 years ago and that SNS use may be a sub-component of one of the self-concept domains. Thus, it was hypothesised that SNSs would relate to general self-concept indirectly, through one of these subdomains. However, it was demonstrated through a series of process analyses that the subdomains of self-concept, including academic and social self-concept, did not mediate the relationship between SNS usage and the adolescents' general self-concept, disproving this hypothesis. It is speculated that other variables are more predictive of the domains of adolescent self-concept than SNS use and that collectively, these explain a greater quantity of the variance in ones' global self-concept. For example, it may be that an adolescent's skills, body, aerobic and anaerobic fitness and mental competence contribute to their athletic self-concept more than SNS use and that athletic self-concept mediates the relationship between the above factors and their general self-concept (Marsh, 1997). Thus, the current study provides support for Shavelson et al.'s (1976) multi-dimensional model and demonstrates that it is still relevant today.

4.6.2. Empirical Implications

The results of the current study have several empirical implications that enhance our understanding and knowledge of this psychological topic. While previous research has focused upon elucidating the relationship between SNS use and self-esteem, self-concept clarity or a domain of self-concept, such as social self-concept, this is the first study to investigate the relationship between SNS use and general self-concept. While processes by which SNSs may enhance or inhibit adolescent self-concept have been alluded to throughout the literature, this study concludes that it does neither. SNS intensity or duration of SNS use do not predict adolescent self-concept nor is an indirect relationship present, as mediated by participant attributes or SNS activity. These findings pave the way for future research. For example, experimental research in the area of SNS use and adolescent self-concept is not justified by this study's findings. Instead, it guides future researchers towards establishing the causal effects of SNS use on adolescent well-being, exploring how over-using SNSs may displace activities which are protective of adolescent well-being and investigating this relationship in a clinical population because it has been established that adolescents with mental health problems are more likely to use SNSs excessively (Heffer, Good, Daly, MacDonell, & Willoughby, 2019; Nesi, Miller, & Prinstein, 2017). Furthermore, this study informs future researchers of the shortcomings of self-report measures of SNS use, that is, that they are subject to over-reporting. This may be a result of retrospective bias as

postulated by Valkenburg and Peter (2011); or, it may illustrate that the scaremongering tactics employed by mainstream media as to the negative consequences of SNS use, though sparsely evidenced, are being assimilated by teenagers and their parents, causing them to exaggerate their estimations of their duration of SNS use. Thus, this study advocates for the integration of SNS use recording application measures into future research designs. Before this study, no descriptive information on the extent of adolescent SNS use in Ireland had been published.

4.6.3. Pragmatic Implications

This research provides parents, guardians and educators with objective knowledge regarding adolescent SNS usage. It is important to promote parental and educator awareness of typical adolescent SNS use, including duration of use and the type of sites and activities youngsters are engaging in. They can refer to this information when determining whether their child or student is using SNSs adaptively. In addition, it informs them that SNS usage does not predict their adolescents' self-concept. This should help alleviate parental anxiety regarding the problematic outcomes associated with SNS use of which there is often a heavy emphasis on in the mass media (Coyne, Rogers, Zurcher, Stockdale, & Booth, 2020). The current study also informs parents and adolescents that they are overestimating their SNS usage. Parents and teens may not differentiate between SNS use and other online activities, such as online gaming or streaming services. Further, parents and adolescents may have assimilated the negative portrayal of SNS use in the mass media. The current study advocates for promoting awareness of activities that adolescents are in engaging in online, among adolescents themselves and parents.

The ISPCC submitted a report to the Joint Committee on Children and Youth Affairs, entitled "Briefing on Children and Cyber Safety" in 2017. To compile this report, the ISPCC's internal working group on cyber safety conducted a case review of the cyber-related issues. They analysed phone calls made to Childline, which is a listening service for CYP, online contacts, calls to their adult helpline and childhood support cases. Staff interviews and focus groups were also conducted. The authors claimed that teenagers' identity struggles were exacerbated by their experiences online and surmised that this had a deleterious effect on their overall well-being. While this study provides an understanding of this phenomenon in a cohort of CYP who rang Childline services, it may not capture the experience nor apply to the majority of Irish CYP; however, conclusive statements were drawn. The current study allowed for

inferences to be made about the prevalence of SNS use among Irish adolescents and captured a description of SNS behaviour and how it relates to adolescent self-concept. Though this study has its limitations in relation to its external validity, it carries more weight on the hierarchy of evidence than the case review study carried out by the ISPCC and thus, is more informative to policymakers.

However, the ISPCC case review (2017) was the basis for which the Joint Committee on Children and Youth Affairs (JCCYA) compiled their report on Cyber Security for Children and Young Adults, which the GOI cited as being incremental in the development of their Action Plan for Online Safety (GOI, 2018a; JCCYA, 2018). This is problematic because the action plan set out 25 actions based on a study of poor methodological rigour. Some of these actions centre on the premise that SNSs are detrimental to the mental health of CYP, which, as highlighted throughout the current study's review and empirical paper, there is little empirical evidence to support. Governmental action plans should base their actions upon rigorous research, such as the current study. Not only are the results of the current study pertinent to future governmental Action Plans, but it also synthesises and critically analyses the state of the research in this area. It is important that the National Advisory Council for Online Safety (NACOS), which was established as a result of the Action Plan and plays a key role in disseminating national and international research, communicates the findings of this study to the GOI, stakeholders and the wider public.

In 2018, the DES launched the Wellbeing Policy and Framework for Practice which recognised the responsibility which schools have in nurturing resilience in students. It required schools nationwide to adopt a preventative, evidence-informed, whole-school approach to well-being promotion by 2023. This document stated this preventative wellbeing promotion process should focus on enhancing school-based protective factors, one of these being "opportunities to develop the necessary skills to cope with using online technology in a safe and appropriate way" (DES, 2018, p. 12). EPs play a key role in this initiative whereby they build the capacity of schools to promote this protective factor. To do so, EPs must not only consume research in this area, but they also need to adopt a critical lens when doing so, to separate studies of high quality or ability from those that are not (Keith, 2008). They then need to integrate findings from various research sources, summarise them and convey those findings to their schools (Keith, 2008). They do this through the provision of systemic support and

development work, consultation and staff training. This enables educators to apply research to their practice.

4.6.4. Implications for EPs' Practice

From this literature review and empirical study, the key messages for EPs when working with schools are:

1. SNSs are pervasive among Irish adolescents. The most popular SNSs are Snapchat, Instagram, and WhatsApp while the most common activities on SNSs are talking with friends and family, finding entertaining content and feeling involved in what is going on with others. 85% of teens use SNSs during their free time, 17% use SNSs during school and 26% use them during social occasions. The above information provides EPs with baseline evidence in an Irish context, which is useful when consulting with stakeholders with concerns about the frequency, duration or type of their adolescents SNS use. EPs can help stakeholders determine whether their adolescent's SNS use is greater or less than these averages or whether the activities and sites they are engaging in are atypical.

2. Adolescents and their parents overestimate the duration of their SNS usage. EPs need to integrate this finding into consultative practice. If the duration or intensity of adolescent SNS use is of concern to a parent, EPs should assess how accurate their reporting is and advise accurate measurement and differentiation between types of online activities before intervention.

3. Neither SNS intensity nor duration were related to adolescent self-concept. This demonstrates that adolescent self-concept is neither suppressed nor promoted by SNS use. This relationship was not mediated by participant attributes or tendency to engage in upward social comparison nor was it moderated by the type of their SNS activities. It is the responsibility of EPs to inform parents, guardians and educators of this so that they may adapt their technology-related parenting practices and digital well-being and online safety curriculums, accordingly.

4. A review of previous research indicated that there was evidence for a negative association between self-esteem and SNS usage. Researchers have postulated that this relationship is mediated by social comparison, which is a process of comparing the self to others to evaluate one's worth (Sherlock & Wagstaff, 2018; Vogel et al., 2014). SNSs provide teens with an abundance of opportunities to engage in social comparison and teens risk lowering their self-esteem when

constantly comparing themselves to others, particularly because they are comparing themselves with peers' idealized online representations (Sherlock & Wagstaff, 2018). EPs are tasked with raising the awareness of parents, guardians and educators alike that if a CYP has the propensity to engage in social comparison, their self-esteem may be at risk. They also have a responsibility to support educators in the establishment of preventative schoolwide programmes and practices, such as the promotion of the self-esteem of CYP, educating CYP as to the dangers of engaging in social comparison on SNSs, identifying CYP who have this propensity and providing them with more intensive intervention.

5. Previous research has indicated that girls are more susceptible to SNS addiction than boys. Girls are also more likely to have low self-esteem because they use SNSs to compare themselves to others and self-validate, whereas boys tend to use it as a positive leisure activity (Andreassen et al., 2017; Blomfield Neira & Barber, 2014; Sherlock & Wagstaff, 2018; Vogel et al., 2014). This informs EPs that girls are more at risk than boys in terms of SNS addiction and compromised self-esteem, allowing them to perceive this vulnerability easily in practice and to act on it.

6. Younger adolescents are more affected by the addictive use of SNSs than their older counterparts. Additionally, investment in SNSs is linked to lower self-esteem for younger adolescents again due to higher levels of social comparison. This suggests that younger adolescents are more vulnerable perhaps due to the malleability of their self-esteem at this time. Increasing EPs' awareness of this vulnerable subgroup will allow them to detect difficulties in this area and intervene early (Andreassen et al., 2017; Blomfield Neira & Barber, 2014; Kalpidou et al., 2011; Sherlock & Wagstaff, 2018).

7. When consulting with parents and educators about online safety, EPs should stress that the effect of using SNSs is dependent on the predisposition and behaviour of the adolescent. For example, CYP who use SNSs more intensely are more likely to engage in social comparison when their self-worth is contingent on approval from others (Stapleton et al., 2017). This may result in excessive SNS use for this population (Kanat-Maymon et al., 2018). Therefore, it will be important that EPs take into consideration that CYP whose self-worth is contingent on social acceptance are more susceptible to SNS addiction and to engage in social comparison, a process in deleterious to self-esteem. They should

disseminate this information to parents and educators to empower them to promote CYPs' self-worth in other areas.

8. There is evidence for a positive relationship between adolescents' SNS use and their social self-concept. This relationship is mediated by the amount of positive feedback that adolescents received on SNSs. Thus, receiving validation and feedback from others on SNSs enhances adolescents' social self-concept (Blomfield Neira & Barber, 2014; Valkenburg et al., 2017; Valkenburg et al., 2006). This informs EPs that there are benefits associated with SNS use and not merely negative consequences, as commonly portrayed. These should be carefully weighed when EPs are liaising with school principals about acceptable usage and wellbeing policies, when consulting with parents and adolescents and when developing educator training.

9. While SNSs have become an integral aspect of their everyday life, results from the current study suggest that usage may be less harmful to typically developing teens than often alluded to. Not only is previous research not methodologically robust enough to conclude that SNSs has a deleterious effect on adolescent mental health but several benefits of SNSs have been established such as enhanced social support, greater connectedness with others and an increased sense of belonging (Junghyun & Jong-Eun Roselyn, 2011; Nadkarni & Hofmann, 2012; Shapiro & Margolin, 2014). There is emerging evidence to suggest that mental health harms arising from engagement with SNSs arise from displaced sleep and physical activity or exposure to cyberbullying, though further research is warranted in this area (Viner et al., 2019). When working with CYP it will be important that EPs focus on ensuring sufficient sleep and physical activity in CYP, increasing their resilience to cyberbullying and implementing universal cyberbullying prevention programmes, rather encouraging SNS abstinence.

While the literature review provides EPs with a critical account of previous research, it also contributes new and insightful evidence which EPs must assimilate into their practice when supporting schools to achieve the goal of developing students' skills to navigate online technology safely and appropriately. The above points should be integrated with other research in the area and disseminated to school principals to support them in their development of whole-school approaches to Well-Being promotion and Acceptable Usage of Smartphones Policies. Moreover, the points listed above are informative to the formulation of Online Safety Programmes for post-primary

schools, which was one of the key actions set out in the GOI's Action Plan for Online Safety and when EPs are developing training for educators of the implementation these programmes. It is important that these programmes are focused on educating adolescents on the safe and responsible use of SNSs without condemning its use, unjustifiably, and include information on the importance of sleep hygiene and physical activity and preventing and reporting cyberbullying, as suggested by Viner et al. (2019).

4.7. Impact Statement

The findings of the current study have empirical, theoretical, practical and political implications.

Empirically, this is the first study to investigate the relationship between SNS usage and general self-concept and to provide descriptive information on the extent of adolescent SNSs use in Ireland. The results of this study indicated that SNS usage is not predictive of adolescent self-concept, nor is this relationship mediated by their attributes, their tendency to engage in upward social comparison or moderated by their SNS activities. Thus, this study established conclusively that SNS use and global self-concept are unrelated in 16-18-year olds. These results act as a springboard for research because they guide researchers towards investigating this relationship in a clinical population and establishing the causal effects of SNS use on adolescent well-being. Exploring how over-using SNSs may displace activities that are protective of adolescent well-being is also an area for future research. This study informs future researchers of the limitations of self-report measures of SNS use and advocates for the integration of SNS use recording application measures to future studies to improve methodological quality.

Theoretically, this study aimed to apply Shavelson et al.'s (1976) multi-dimensional model of self-concept to modern society. According to this model, the system of categories of which an adolescent's self-concept is comprised is culturally dependent. With the pervasiveness of new media technologies transforming youth culture, Shavelson et al.'s (1976) model required re-examination. However, the current study concluded that Shavelson et al.'s (1976) multi-dimensional model remains relevant in this networked era.

Practically, this research provides parents and guardians with the assurance that SNS use does not suppress their adolescent's self-concept and informs the management of their adolescent's interactions with this technology. This study also informs the

implementation of the Wellbeing Policy and Framework for Practice, which states that by 2023, Irish schools are required to adopt a preventative, evidence-informed, whole-school approach to well-being promotion (DES, 2018). According to this initiative, one of the school-based protective factors which schools play a vital role in strengthening is the development of skills to cope with and use online technology safely and appropriately. The study's findings should be taken into account when principals are making provisions for the development of these skills and developing Wellbeing and Acceptable Usage policies. The current study provides educators with guidance in this area when formulating digital well-being and cyber safety programmes. EPs play a key role in building the capacity of schools to promote this protective factor. It is important that EPs disseminate the findings of the current study to schools through systemic support and development work and staff training. EPs should also integrate this study's results into consultative practice, particularly when parents or educators have concerns regarding their adolescent's or student's SNS usage. In 2018, as a result of the GOI's Action Plan for Online Safety (2018), the NACOS was established, which plays a key role in disseminating research in this area and providing advice to the GOI and the general public. NACOS must communicate the findings of the current study accordingly, to ensure future Government Action Plans are evidence-informed and to inform the general publics' awareness and practices in this area. In this regard, the researcher has already begun to disseminate the results of the current study. They were presented to two teams of EPs and subsequently disseminated to post-primary schools. The results were also presented at the 2019 PSI Annual Conference and the NEPS Business Meeting and were well-received. The study will continue to be disseminated by the researcher through publication and Child and Adolescent Mental Health service training. There is also a plan in place to arrange a seminar with the NACOS research subgroup. It is envisioned this will inspire future governmental action plans.

In conclusion, the current research will contribute to the debate on the impact of SNSs on adolescent well-being, provide an impetus for future research and inform future governmental action plans for online safety. This research will also empower EP's to inform parenting practices, the development of digital wellbeing programmes and the provision of school policy.

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Appendices

Appendix A: Search terms entered into databases

Search Term Results	ERIC	PsycInfo	Medline	PsycArticles
"social media" OR "social-network*" OR "Facebook" OR "Instagram" OR "Youtube" OR "Snapchat" OR "Twitter" OR "Whatsapp" OR "Tumblr" OR "Pinterest", OR "Flickr" AND "self-concept*" OR "self-perception*" OR "self-image*" OR "self-worth" OR "self-esteem" OR "identity"	995	4,508	1,451	122

Appendix B: Studies included in the review based on the inclusion criteria.

No	Details of study

1   Andreassen, C. S., Pallesen, S., & Griffiths, M. D. (2017). The relationship between addictive use of social media, narcissism, and self-esteem: Findings from a large national survey. *Addictive Behaviors, 64*, 287-293.

2   Appel, M., Schreiner, C., Weber, S., Mara, M., & Gnambs, T. (2016). Intensity of Facebook Use Is Associated With Lower Self-Concept Clarity: Cross-Sectional and Longitudinal Evidence. J*ournal Of Media Psychology: Theories, Methods, And Applications*, *30*(3), 160-172.

3   Błachnio, A., Przepiorka, A., & Pantic, I. (2016). Association between facebook addiction, self-esteem and life satisfaction: A cross-sectional study. *Computers in Human Behavior, 55*(Part B), 701-705.

4   Blomfield Neira, C. J., & Barber, B. L. (2014). Social networking site use: Linked to adolescents' social self-concept, self-esteem, and depressed mood. *Australian Journal of Psychology, 66*(1), 56-64.

5   Cingel, D. P., & Olsen, M. K. (2018). Getting over the hump: Examining curvilinear relationships between adolescent self-esteem and Facebook use. *Journal of Broadcasting & Electronic Media, 62*(2), 215-231.

6   Errasti, J., Amigo, I., & Villadangos, M. (2017). Emotional uses of Facebook and Twitter: Its relation with empathy, narcissism, and self-esteem in adolescence. *Psychological Reports, 120*(6), 997-1018.

7   Hawi, N. S., & Samaha, M. (2017). The relations among social media addiction, self-esteem, and life satisfaction in university students. *Social Science Computer Review, 35*(5), 576-586.

8   Kalpidou, M., Costin, D., & Morris, J. (2011). The relationship between Facebook and the well-being of undergraduate college students. *Cyberpsychology, Behavior, and Social Networking, 14*(4), 183-189.

9   Kanat-Maymon, Y., Almog, L., Cohen, R., & Amichai-Hamburger, Y. (2018). Contingent self-worth and Facebook addiction. *Computers in Human Behavior, 88*, 227-235.

10   Košir, K., Horvat, M., Aram, U., Jurinec, N., & Tement, S. (2016). Does being on Facebook make me (feel) accepted in the classroom? The relationships between early adolescents' Facebook usage, classroom peer acceptance and self-concept. *Computers in Human Behavior, 62*, 375-384.

11   Sherlock, M., & Wagstaff, D. L. (2018). Exploring the relationship between frequency of Instagram use, exposure to idealized images, and psychological well-being in women. *Psychology of Popular Media Culture, 8*(4), 482–490.

12   Stapleton, P., Luiz, G., & Chatwin, H. (2017). Generation Validation: The Role of Social Comparison in Use of Instagram Among Emerging Adults. *CyberPsychology, Behavior and Social Networking*, 20(3), 142-149.

13   Valkenburg, P. M., Peter, J., & Schouten, A. P. (2006). Friend Networking Sites and Their Relationship to Adolescents' Well-Being and Social Self-Esteem. *CyberPsychology & Behavior, 9*(5), 584-590.

14   Valkenburg, P. M., Koutamanis, M., & Vossen, H. G. M. (2017). The concurrent and longitudinal relationships between adolescents' use of social network sites and their social self-esteem. *Computers in Human Behavior*, 76, 35-4

15   Vogel, E. A., Rose, J. P., Roberts, L. R., & Eckles, K. (2014). Social comparison, social media, and self-esteem. *Psychology of Popular Media Culture, 3*(4), 206-222.

16   Wang, Y. n., Nie, R., Li, Z., & Zhou, N. (2018). WeChat Moments use and self-esteem among Chinese adults: The mediating roles of personal power and social acceptance and the moderating roles of gender and age. *Personality and Individual Differences, 131*, 31-37.

17   Woods, H. C., & Scott, H. (2016). #Sleepyteens: Social media use in adolescence is associated with poor sleep quality, anxiety, depression and low self-esteem. *Journal Of Adolescence, 51*, 41-49.

Appendix C: Summary of studies included in the review.

Authors	Country	Participants	Study Design	Measures	Results
Andreassen et al. (2017)	Norway	N = 23,532 Age range = 16 - 88 Mean age = 35.8 years	Cross-sectional	Bergen Social Media Addiction Scale, Narcissistic Personality Inventory, Rosenberg Self-Esteem Scale (RSES)	Self-esteem was negatively related to addictive use of social media
Appel et al. (2016)	Austria	N = 491 Age range = 14 - 48 Mean age = 20.0	Part 1 and 2 were cross-sectional while part 3 was longitudinal	Self-Concept Clarity (SCC), FBIS, Facebook Access Frequency (FAF)	There was a strong negative association between SCC and FI. More intensive use of Facebook predicted less SCC over time.
Błachnio et al. (2015)	Poland	N = 381 Age range = 12 - 58 Mean age = 20.7	Cross-sectional	FIS, Bergen Facebook Addiction Scale (BFAS), RSES, Satisfaction with Life Scale (SLS) Scale (SLS).	Facebook addiction was related to lower self-esteem

Blomfield Neira & Barber (2014)	Austrailia	N = 1,819 Age range = 13 - 17 Mean age = 14.6	Cross-sectional	SNS frequency scale (adapted), FIS (adapted), Self-Description Questionnaire (adapted), Self-esteem Scale, Depressed Mood Scale	Frequency of SNS use was associated with higher social self-concept while investment in SNSs was associated with lower self-esteem
Cingel & Olsen (2018)	The Netherlands	N = 337 Age range = 12 - 18 Mean age = 15.1	Cross-sectional	Self-report active use of Facebook and number of Facebook friends and Facebook activities, RSES	A curvilinear relationship between self-esteem and Facebook use was found.
Errasti et al. (2017)	Spain	N = 503 Age range: 14 – 17 Mean age not stated	Cross-sectional	Basic Empathy Scale, the Narcissistic Personality Inventory, RSES, Use of Facebook Questionnaire, Use of Twitter Questionnaire	Greater use of Facebook and Twitter was associated with lower self-esteem.
Hawi1 & Maya (2017)	Lebanon	N = 364 Age range not provided Mean age = 21.1	Cross-sectional	Social Media Addiction Questionnaire, RSES, SLS.	Addictive use of social media had a negative association with self-esteem

Kalpidou et al. (2011)	United States of America	N = 70 Age range not provided Mean age = 19.61	Cross-sectional	Self-report measures of time, number of friends, emotional and social connection to Facebook, RSES, the Student Adaptation to College Scale	Spending a lot of time on Facebook was related to low self-esteem
Kanat-Maymon et al. (2018)	Israel	N = 417 Age range = 16 - 66 Mean age = 28.2	Study 1 was cross-sectional and Study 2 had a 21-day daily diary design	BFAS, self-reported Facebook usage time, Contingencies of Self-Worth Scale, RSES, Big Five Inventory, Single Item Self-Esteem Scale	Contingent self-worth was related to the emergence and sustainment of Facebook addiction
Košir et al. (2016)	Slovenia	N = 404 Age range = 11 – 15 Mean age = 13.2	Cross-sectional	Sociometric measures, teacher assessed social acceptance, FBIS, SDQ-II, self-reported Facebook usage time	Teens who had a Facebook account scored higher in peer relations self-concept. Emotional connectedness to Facebook was beneficial for girls' peer relations self-concept.
Sherlock & Wagstaff (2018)	Australia	N = 129 Age range = 18 - 35	Part 1 was cross-sectional while part 2 was experimental	Centre for Epidemiologic Studies Depression Scale, The Heatherton Self-Esteem Scale, The Body Image Disturbance	Frequency of Instagram use is correlated with self-esteem and appearance-related self-perception

				Questionnaire, The Physical Appearance State and Trait Anxiety Scale, The State-Trait Anxiety Inventory, Iowa-Netherlands Comparison Orientation Scale and Self-rated physical attractiveness and frequency of Instagram use.	
		Mean age = 24.6			
Stapleton et al. (2017)	Australia	N = 237 Age range = 18 - 25 Mean age = 23.1	Cross-sectional	Iowa-Netherlands Comparison Orientation Measure, FIS (adapted), RSES and the Contingencies of Self Worth Scale.	Social comparison on Instagram mediated the relationship between contingent self-worth and self-esteem.
Valkenburg et al. (2006)	The Netherlands	N = 881 Age range = 10 - 19 Mean age = 14.8	Cross-sectional	SPPA, SLS, Self-reported use of SNSs, frequency of reactions to profiles, tone of reactions to profiles and relationships established through SNSs.	The frequency with which adolescents used the site had an indirect effect on their social self-esteem. Positive feedback on the profiles enhanced adolescents' social self-esteem whereas negative feedback decreased their self-esteem

Valkenburg et al. (2017)	The Netherlands	N = 852 Age range = 10 - 15 Mean age = 13.5	Longitudinal	SPPA, self-reported frequency of SNS use, self-reported frequency of receiving positive feedback	Adolescents' SNS use was positively correlated with their social self-esteem. Longitudinally, social self-esteem influenced their SNS use in subsequent years.
Vogel et al. (2014)	United States	N = 273 Age range not provided Mean age = 19.3	Part 1 was cross-sectional while part 2 was experimental	Self-reported frequency of Facebook use, self-reported comparisons on Facebook, Rosenberg Self-Esteem Scale.	Upward social comparison mediates the link between Facebook use and self-esteem.
Wang et al. (2018)	China	N = 325 Age range = 18 - 69 Mean age = 32.7	Cross-sectional	RSES, FIS (adapted), Sense of the Power scale, Social Acceptance Scale, self-reported number of Likes on posts, rate of updates, length of use history, the number of WeChat Moments friends and the average time	WeChat Moments use intensity and received likes were positively associated with self-esteem, whereas status updates are negatively associated with self-esteem.

				spent on WeChat Moments daily.	
Woods & Scott (2016)	Scotland	N = 467 Age range = 11 - 17 Mean age was not reported	Cross-sectional	Pittsburgh Sleep Quality Index, the Hospital Anxiety and Depression Scale, RSES, Social Media Use Integration Scale, Self-reported overall and night-time-specific social media use.	Adolescents who used social media more and were more emotionally invested in it experienced lower self-esteem.

Appendix D: Criteria for WoE A.

Criteria	Quality Rating			
	Zero (0)	Low (1)	Medium (2)	High (3)
Sample size	Small sample size	Sample size not justified	Sample size justified using variance and effect estimates	Sample size justified using power description
Reliability reporting	Reliability of measures not reported or not based on data in hand	Reliability reported for the minority of measures based on data in hand	Reliability reported for the majority of measures based on data in hand	Reliability reported for all measures based on data in hand
Reliability Coefficient	Instruments produce reliability coefficient of <.50 or reliability not presented	Instruments produce reliability coefficient >.50	Instruments produce a reliability coefficient > .70	Instruments produce a reliability coefficient >.80
Validity	Validity is not reported	Validity referred to but source unclear	Validity is inducted from prior study or test manual	Score validity is empirically evaluated based on data generated within the study
Sources of data	Sources of data not specified	Data was not collected from multiple sources	Data was collected from two sources	Data was collected using from multiple sources (more than two)
Effect size reporting	Effect sizes not reported	Effect sizes not reported for	Effect sizes are reported for	Effect sizes are reported for

		primary outcomes which were not statistically significant or effect statistic used is not clearly identified	each primary outcome and the effect statistic used is clearly identified.	primary and secondary outcomes and the effect statistic used is clearly identified
Confounding variables	Confounding variables not measured and adjusted statistically for	One confounding variable measured and statistically accounted for	Two confounding variables measured and adjusted statistically for	More than two confounding variables measured and adjusted statistically for

Appendix E: Criteria for WoE B

Criteria	Quality Rating			
	Zero	Low (1)	Medium (2)	High (3)
Design	Observational	Case-control	Cross-sectional	Experimental or Longitudinal
Demographic information	Demographic information not clearly specified and defined (none of the following: age range, mean age and gender of participants)	The study provided one of the following pieces of demographical information: age range, mean age and gender of participants	The study provided two of the following pieces of demographical information: age range, mean age and gender of participants	Demographic information clearly specified and defined (specifically age range, mean age and gender of participants)
Selectivity in Reporting Findings	The study presented findings for some primary outcome measures	The study presented findings for most primary outcome measures	The study presented findings for all primary measures	The study presented findings for primary and secondary measures
Sampling	Method of sampling not specified	Snowball, self-selected or convenience sampling	Cluster or systematic sampling	Random sampling
Use of standardised instruments	No standardised instruments were to measure outcomes	Minority variables were measured using standardised instruments	Majority of variables were measured using standardised instruments	All variables were measured using standardised instruments

Gender balance	Researchers purposively studied solely males or females	Gender not evenly distributed	Gender unevenly distributed but corrected using post-hoc statistical tests	Gender evenly distributed (50:50-40:60)

Appendix F: Criteria for WoE C

Criteria	Quality Rating			
	Zero (0)	Low (1)	Medium (2)	High (3)
SNS measures	SNS usage measures not clearly linked to review research question	SNS usage (intensity, frequency or investment) not measured	Specific SNS (e.g. Facebook or Instagram) usage (intensity, frequency or investment)	SNS usage (intensity, frequency or investment)
Self-concept measures	Self-concept, specific component of self-concept not measured, self-image or self-esteem measured	Self-image or self-esteem measured	Specific component of self-concept measured (academic, emotional, social or physical self-concept)	General self-concept measured
Age of participants	The study employed a non-adolescent sample	The minority of the sample consists of adolescents 12-18	The majority of the sample consists of adolescents aged 12-18	Sample consists of adolescents aged 12-18

Appendix G: Classification of WoE Scores

Evidence	Score Equivalence	Overall WOE Averaged Scores
Strong	High	2.5 - 3.0
Promising	Medium	1.5-2.4
Weak	Low	1.4 or less
Limited to none	Zero	0.0

Appendix H: Questionnaire

<u>Self-Concept and Social Networking Site Usage Questionnaire</u>

Please state your age and gender below:

Age:	Gender:

What I am like:

Instructions for questions 1-45:

We have some sentences here and, as you can see from the top of your sheet where it says "What I am like", we are interested in what each of you is like, what kind of a person you are like. This is a survey, not a test. There are no right or wrong answers. Since teenagers are very different from one another, each of you will be putting down something different.

1. First, let me explain how these questions work. There is a sample question at the top, marked (a). This question talks about two kinds of teenagers, and we want to know which teenagers are most like you.
2. So, what I want you to decide first is whether you are more like the teenagers on the left side who would rather go to the movies, or whether you are more like the teenagers on the right side who would rather go to a sports event. Don't mark anything yet, but first decide which kinds of teenagers are most like you, and go to that side of the sentence.
3. Now the second thing I want you to think about, now that you have decided which kinds of teenagers are most like you, is to decide whether that is only sort of true for you, or really true for you. If it's only sort of true, then put an X in the box under Sort of True for me; if it's really true for you, then put an X in that box, under Really True for me.

Really true for me	Sort of true for me				Sort of true for me	Really true for me
			Sample Sentence			
a. ☐	☐	Some teenagers like to go to the movies in their spare time	**BUT**	Other teenagers would rather go to sporting events	☐	☐

4. For each sentence, you only check one box. Sometimes it will be on one side of the page, another time it will be on the other side of the page, but you can only check one box for each sentence. YOU DON'T CHECK BOTH SIDES, JUST THE ONE SIDE MOST LIKE YOU.

OK, that one was just for practice. Continue with these sentences. For each one, just check one box—the one that goes with what is true for you, what you are most like.

	Really true for me	Sort of true for me				Sort of true for me	Really true for me
1.	☐	☐	Some teenagers feel that they are just as smart as others their age	BUT	Other teenagers aren't so sure and wonder if they are as smart	☐	☐
2.	☐	☐	Some teenagers find it hard to make friends	BUT	Other teenagers find it pretty easy to make friends	☐	☐
3.	☐	☐	Some teenagers do very well at all kinds of sports	BUT	Other teenagers don't feel that they are very good when it comes to sports	☐	☐
4.	☐	☐	Some teenagers are not happy with the way they look	BUT	Other teenagers are happy with the way they look	☐	☐
5.	☐	☐	Some teenagers feel that they are ready to do well at a part-time job	BUT	Other teenagers feel that they are not quite ready to handle a part-time job	☐	☐
6.	☐	☐	Some teenagers feel that if they are romantically interested in someone, that person will like them back	BUT	Other teenagers worry that when they like someone romantically, that person won't like them back	☐	☐
7.	☐	☐	Some teenagers usually do the right thing	BUT	Other teenagers often don't do what they know is right	☐	☐
8.	☐	☐	Some teenagers are able to make really close friends	BUT	Other teenagers find it hard to make really close friends	☐	☐
9.	☐	☐	Some teenagers are often disappointed with themselves	BUT	Other teenagers are pretty pleased with themselves	☐	☐
10.	☐	☐	Some teenagers are pretty slow in finishing their school work	BUT	Other teenagers can do their school work quickly	☐	☐
11.	☐	☐	Some teenagers know how to make classmates like them	BUT	Other teenagers don't know how to make classmates like them	☐	☐
12.	☐	☐	Some teenagers think they could do well at just about any new athletic activity	BUT	Other teenagers are afraid they might not do well at a new athletic activity	☐	☐
13.	☐	☐	Some teenagers wish their body was different	BUT	Other teenagers like their body the way it is	☐	☐
14.	☐	☐	Some teenagers feel that they don't have enough skills to do well at a job	BUT	Other teenagers feel that they do have enough skills to do a job well	☐	☐

	Really true for me	Sort of true for me				Sort of true for me	Really true for me
15.	☐	☐	Some teenagers are not dating the people they are really attracted to	BUT	Other teenagers are dating those people they are attracted to	☐	☐
16.	☐	☐	Some teenagers often get in trouble because of things they do	BUT	Other teenagers usually don't do things that get them in trouble	☐	☐
17.	☐	☐	Some teenagers don't know how to find a close friend with whom they can share secrets	BUT	Other teenagers do know how to find a close friend with whom they can share secrets	☐	☐
18.	☐	☐	Some teenagers don't like the way they are leading their life	BUT	Other teenagers do like the way they are leading their life	☐	☐
19.	☐	☐	Some teenagers do very well at their classwork	BUT	Other teenagers don't do very well at their classwork	☐	☐
20.	☐	☐	Some teenagers don't have the social skills to make friends	BUT	Other teenagers do have the social skills to make friends	☐	☐
21.	☐	☐	Some teenagers feel that they are better than others their age at sports	BUT	Other teenagers don't feel they can play as well	☐	☐
22.	☐	☐	Some teenagers wish their physical appearance was different	BUT	Other teenagers like their physical appearance the way it is	☐	☐
23.	☐	☐	Some teenagers feel they are old enough to get and keep a paying job	BUT	Other teenagers do not feel that they are old enough, yet, to really handle a job well	☐	☐
24.	☐	☐	Some teenagers feel that people their age will be romantically attracted to them	BUT	Other teenagers worry about whether people their age will be attracted to them	☐	☐
25.	☐	☐	Some teenagers feel really good about the way they act	BUT	Other teenagers don't feel that good about the way they often act	☐	☐
26.	☐	☐	Some teenagers do know what it takes to develop a close friendship with a peer	BUT	Other teenagers don't know what to do to form a close friendship with a peer	☐	☐
27.	☐	☐	Some teenagers are happy with themselves most of the time	BUT	Other teenagers are often not happy with themselves	☐	☐

	Really true for me	Sort of true for me				Sort of true for me	Really true for me
28.	☐	☐	Some teenagers feel that they are just as smart as others their age	BUT	Other teenagers aren't so sure and wonder if they are as smart	☐	☐
29.	☐	☐	Some teenagers understand how to get peers to accept them	BUT	Other teenagers don't understand how to get peers to accept them	☐	☐
30.	☐	☐	Some teenagers don't do well at new outdoor games	BUT	Other teenagers are good at new games right away	☐	☐
31.	☐	☐	Some teenagers think that they are good looking	BUT	Other teenagers think that they are not very good looking	☐	☐
32.	☐	☐	Some teenagers feel like they could do better at work they do for pay	BUT	Other teenagers feel that they are doing really well at work they do for pay	☐	☐
33.	☐	☐	Some teenagers feel that they are fun and interesting on a date	BUT	Other teenagers wonder about how fun and interesting they are on a date	☐	☐
34.	☐	☐	Some teenagers do things they know they shouldn't do	BUT	Other teenagers hardly ever do things they know they shouldn't do	☐	☐
35.	☐	☐	Some teenagers find it hard to make friends they can really trust	BUT	Other teenagers are able to make close friends they can really trust	☐	☐
36.	☐	☐	Some teenagers like the kind of person they are	BUT	Other teenagers often wish they were someone else	☐	☐
37.	☐	☐	Some teenagers feel that they are pretty intelligent	BUT	Other teenagers question whether they are intelligent	☐	☐
38.	☐	☐	Some teenagers know how to become popular	BUT	Other teenagers do not know how to become popular	☐	☐
39.	☐	☐	Some teenagers do not feel that they are very athletic	BUT	Other teenagers feel that they are very athletic	☐	☐
40.	☐	☐	Some teenagers really like their looks	BUT	Other teenagers wish they looked different	☐	☐
41.	☐	☐	Some teenagers feel that they are really able to handle the work on a paying job	BUT	Other teenagers wonder if they are really doing as good a job at work as they should be doing	☐	☐
42.	☐	☐	Some teenagers usually don't go out with people they would really like to date	BUT	Other teenagers do go out with people they really want to date	☐	☐

TURN THE PAGE →

	Really true for me	Sort of true for me				Sort of true for me	Really true for me
43.	☐	☐	Some teenagers usually act the way they know they are supposed to	BUT	Other teenagers often don't act the way they are supposed to	☐	☐
44.	☐	☐	Some teenagers don't understand what they should do to have a friend close enough to share personal thoughts with	BUT	Other teenagers do understand what to do to have a close friend with whom they can share personal thoughts.	☐	☐
45.	☐	☐	Some teenagers are very happy being the way they are	BUT	Other teenagers often wish they were different	☐	☐

Instructions for questions 46-50: Listed below are a few statements about your relationships with others. How much is each statement true or false for you?

		Definitely false	Mostly false	Don't know	Mostly true	Definitely true
46	I am always courteous even to people who a are disagreeable					
47	There have been occasions when I took a advantage of someone					
48	I sometimes try to get even rather than a forgive and forget.					
49	I sometimes feel resentful when I don't get my way.					
50	No matter who I'm talking to, I'm always a good listener.					

Instructions for questions 51-71: The following questions are in relation to Social Networking Site usage. Social networking sites are digital platforms, systems, websites or apps that enable people to create and share content and connect with others.

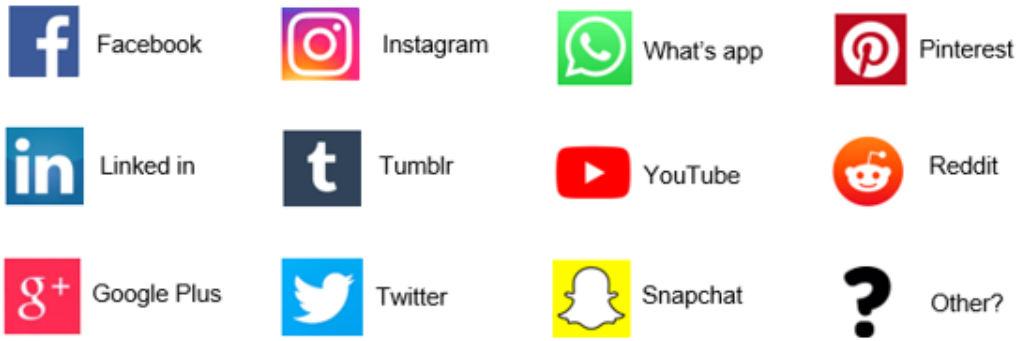51. Do you use Social Networking Sites?

Yes	
No	

If you ticked yes, please proceed to question 52. If you ticked no, please proceed to question 70.

52. How many social networking sites or applications do you have accounts with?

1	2	3	4	5	More (please specify)

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53. Circle the social networking sites or applications which you have accounts with.

Facebook | Instagram | What's app | Pinterest

Linked in | Tumblr | YouTube | Reddit

Google Plus | Twitter | Snapchat | Other?

54. If you circled other in question 53, please specify below the other social networking sites which you have accounts with:

55. Choose the number of friends/followers you currently have on social networking sites in total:

Less than 10	
10-49	
50-99	
100-199	
200-299	
300-399	
More than 400 (please state)	

56. How many times a day do you access social networking sites or application?

Not everyday	Once a day	2-5 times a day	5-10 times a day	10 or more times a day

57. How much time do you spend on social networking sites or applications per day?

Less than 30 minutes	30-60 minutes	1-2 hours	2-3 hours	3-4 hours	5-6 hours	7-8 hours	9 or more hours

58. How often do you post on social networking sites or applications?

Never	Every few months	Every few weeks	Weekly	Daily	Multiple times a day

59. When do you access social networking sites or applications? (tick all that apply)

During free time	Whilst at school/work	During social occasion	Meal times	Any spare moment

60. Do you check social networking sites or applications before you get out of bed?

Yes	No

61. Is checking social networking sites or applications the last thing you do before going to bed?

Yes	No

62. What do you use social networking sites and applications for? (tick all that apply)

To talk to friends and family	
To feel involved with what's going on with other people	
To share content (photos/videos/music/weblinks)	
To post status updates	
To follow celebrities or influencers	
To check in to a location	
Connecting with others with common hobbies or interests	
For inspiration	
To keep up to date on current affairs and news	
To find funny or entertaining content	
Dating	
To meet new friends	
To browse/time waste	
Other (please specify):	

	Not at all	Very little	A little	Quite a lot	A great deal
63. When comparing yourself to others on Social Networking Sites, to what extent do you focus on people who are better off than you?					
64. When comparing yourself to others on Facebook, to what extent do you focus on people who are worse off than you?					

Instructions for questions 65-80: Below are a list of statements about your social networking site use. Please tick the box that most suits you.

		Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
65	Visiting social networking sites is part of my everyday activity							
66	I check my social networking site(s) almost every day							
67	I feel out of touch when I haven't logged onto my social networking site(s) for a day							
68	I feel I am part of the community of my social networking site							
69	I would be sorry if my social networking site(s) shuts down							

70. Do you use a smartphone?

Yes	
No	

If you answered yes, please proceed to question 71. If you answered no, you are not required to continue with the questionnaire. Thank you for your participation.

Instructions for questions 71-80: Rate how often you use your mobile phones to access social networking sites or applications. The following questions are in relation to mobile phone usage.

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		Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree nor Disagree	Somewhat Agree	Agree	Strongly Agree
71	I feel lost when I do not have my mobile phone with me							
72	Using the mobile phone takes a lot of my time							
73	I am obsessed with my mobile phone							
74	When I do not have my mobile phone I feel disconnected							
75	I feel uneasy in places where mobile phone usage is prohibited							

|		Never	Rarely	Occasionally	Sometimes	Frequently	Often	Every time
76	I use the social networking application(s) on my mobile phone							
77	I use my mobile phone to log into my social network							
78	I check my social networking site using my mobile phone							
79	I run a social networking application on my mobile phone							
80	I use my mobile phone social networking application to connect to my social network							

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81. Please indicate whether you use an iOS (iPhone or iPad) device or an android device to access social networking sites:

If you use an iOS device and Screen Time is enabled, please follow the following instructions:

1. Open your settings.
2. Scroll down and tap screen time.
3. Then, select [Last 7 Days]
4. Please record the time you spent using Social Networking over the last 7 days below:

[ ] hours [ ] minutes

If you use an android device, please follow the following instructions:

1. Open the play store.
2. Type in "YourHour" in the search bar.
3. Click install and wait for the app to finish installing.
4. Click on the "YourHour" icon in your menu
5. Click next twice. NEXT
6. In permissions required, click on usage access. Scroll down to "YourHour" and select it. Then slide the allow usage tracking to
7. Click back twice.
8. Press "Draw over other apps" and then slide the share across devices to
9. Click back again then click finish. FINISH
10. Scroll down and where it says "This week's average usage", select:

   ⊙ Click to see this week's report
11. Please record the time you spent on "Social" below:

[ ] hours [ ] minutes

Thank you for participating in this research!

Appendix I: Most Popular Social Networking Sites
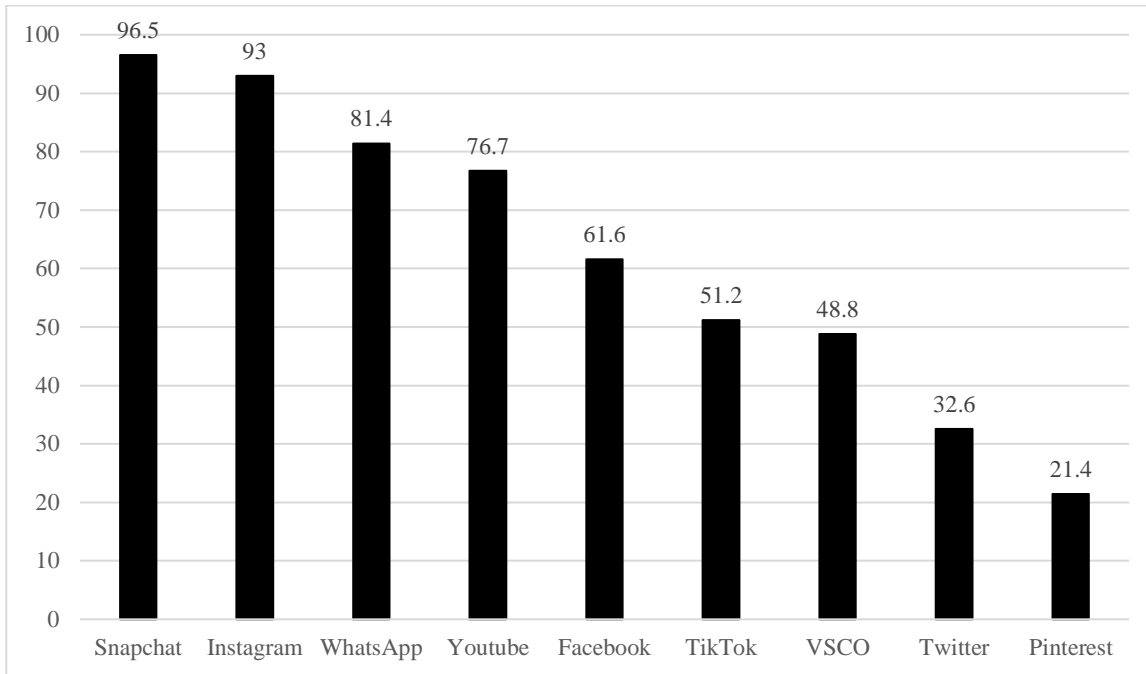
Appendix J: Social Networking Site Activities
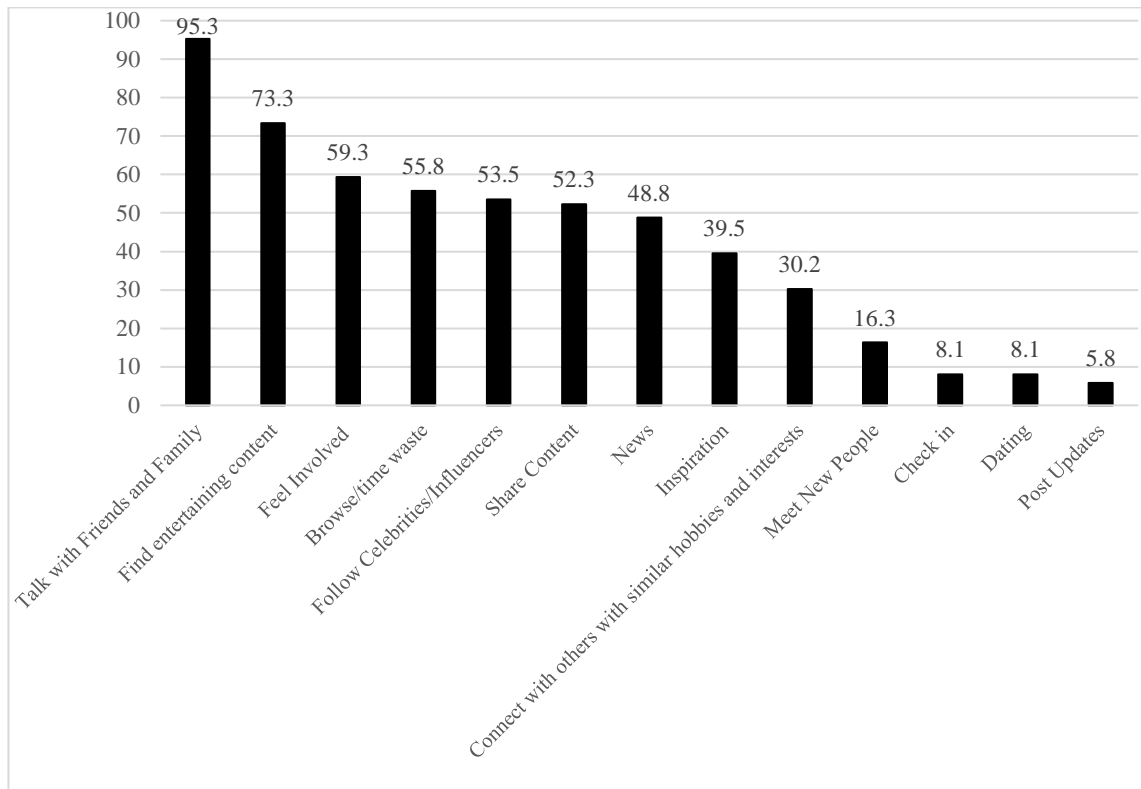
Appendix K: Power Analysis

G*Power 3.1.9.4

File Edit View Tests Calculator Help

Central and noncentral distributions | Protocol of power analyses

```
[38] -- Tuesday, January 07, 2020 -- 10:10:36
F tests – Linear multiple regression: Fixed model, R² deviation from zero
Analysis:   Post hoc: Compute achieved power
Input:      Effect size f²                  = .2
            α err prob                      = 0.05
            Total sample size               = 86
            Number of predictors            = 9
Output:     Noncentrality parameter λ       = 17.2000000
            Critical F                      = 2.0055434
            Numerator df                    = 9
            Denominator df                  = 76
            Power (1–β err prob)            = 0.7933515
```

Test family

F tests

Statistical test

Linear multiple regression: Fixed model, R² deviation from zero

Type of power analysis

Post hoc: Compute achieved power – given α, sample size, and effect size

Input Parameters

Determine =>	Effect size f²	.2
	α err prob	0.05
	Total sample size	86
	Number of predictors	9

Output Parameters

Noncentrality parameter λ	17.2000000
Critical F	2.0055434
Numerator df	9
Denominator df	76
Power (1–β err prob)	0.7933515

X–Y plot for a range of values | Calculate

Appendix L: Independence of Residuals

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.005[a]	.000	-.012	3.75251	.000	.002	1	83	.967	
2	.789[b]	.622	.577	2.42662	.622	15.435	8	75	.000	
3	.796[c]	.634	.579	2.42016	.012	1.200	2	73	.307	1.890

Appendix M: Collinearity Statistics

Model		B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
1	(Constant)	12.324	.429		28.713	.000					
	Social Desirability	.010	.232	.005	.042	.967	.005	.005	.005	1.000	1.000
2	(Constant)	-5.718	1.782		-3.208	.002					
	Social Desirability	-.010	.162	-.005	-.064	.949	.005	-.007	-.005	.858	1.166
	Scholastic Competence	.204	.095	.178	2.142	.035	.444	.240	.152	.731	1.368
	Social Competence	.248	.105	.244	2.350	.021	.591	.262	.167	.469	2.130
	Athletic Competence	.058	.058	.077	.987	.327	.273	.113	.070	.829	1.206
	Physical Appearance	.302	.099	.252	3.043	.003	.469	.331	.216	.732	1.366
	Job Competence	.231	.086	.213	2.693	.009	.420	.297	.191	.803	1.246
	Romantic Appeal	.061	.091	.064	.670	.505	.422	.077	.048	.549	1.822
	Behavioural Conduct	.216	.080	.227	2.701	.009	.455	.298	.192	.712	1.405
	Close Friendships	.078	.089	.083	.880	.382	.478	.101	.062	.561	1.782
3	(Constant)	-4.092	2.071		-1.976	.052					
	Social Desirability	.029	.164	.014	.175	.862	.005	.020	.012	.831	1.203
	Scholastic Competence	.187	.095	.163	1.960	.054	.444	.224	.139	.721	1.387
	Social Competence	.256	.106	.252	2.404	.019	.591	.271	.170	.458	2.184
	Athletic Competence	.075	.059	.100	1.262	.211	.273	.146	.089	.799	1.252
	Physical Appearance	.337	.102	.282	3.310	.001	.469	.361	.234	.690	1.449
	Job Competence	.223	.086	.206	2.596	.011	.420	.291	.184	.798	1.252
	Romantic Appeal	.041	.092	.043	.445	.658	.422	.052	.032	.537	1.861
	Behavioural Conduct	.219	.082	.230	2.658	.010	.455	.297	.188	.669	1.495
	Close Friendships	.064	.090	.068	.717	.476	.478	.084	.051	.550	1.818
	SNS Intensity	-.068	.046	-.118	-1.475	.145	-.097	-.170	-.104	.787	1.271
	Duration of SNS use	1.330E-6	.000	.002	.026	.979	.014	.003	.002	.792	1.263

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Appendix N: Cook's Distance

	Minimum	Maximum	Mean	Std. Deviation	N
Predicted Value	6.0750	20.2492	12.3294	2.97014	85
Std. Predicted Value	-2.106	2.666	.000	1.000	85
Standard Error of Predicted Value	.471	1.372	.846	.180	85
Adjusted Predicted Value	6.0129	20.8800	12.3304	3.00494	85
Residual	-4.00220	7.41134	.00000	2.25661	85
Std. Residual	-1.665	3.083	.000	.939	85
Stud. Residual	-1.787	3.289	.000	1.011	85
Deleted Residual	-4.61315	8.43962	-.00099	2.61937	85
Stud. Deleted Residual	-1.815	3.536	.005	1.033	85
Mahal. Distance	2.238	26.382	9.882	4.695	85
Cook's Distance	.000	.146	.015	.027	85
Centred Leverage Value	.027	.314	.118	.056	85

Note. Dependent Variable: Global Self-Concept

Appendix O: Probability and Scatter Plots

Probability Plot of Regression Standardized Residuals

Dependent Variable: Global Self-Concept

Scatterplot

Dependent Variable: Global Self-Concept
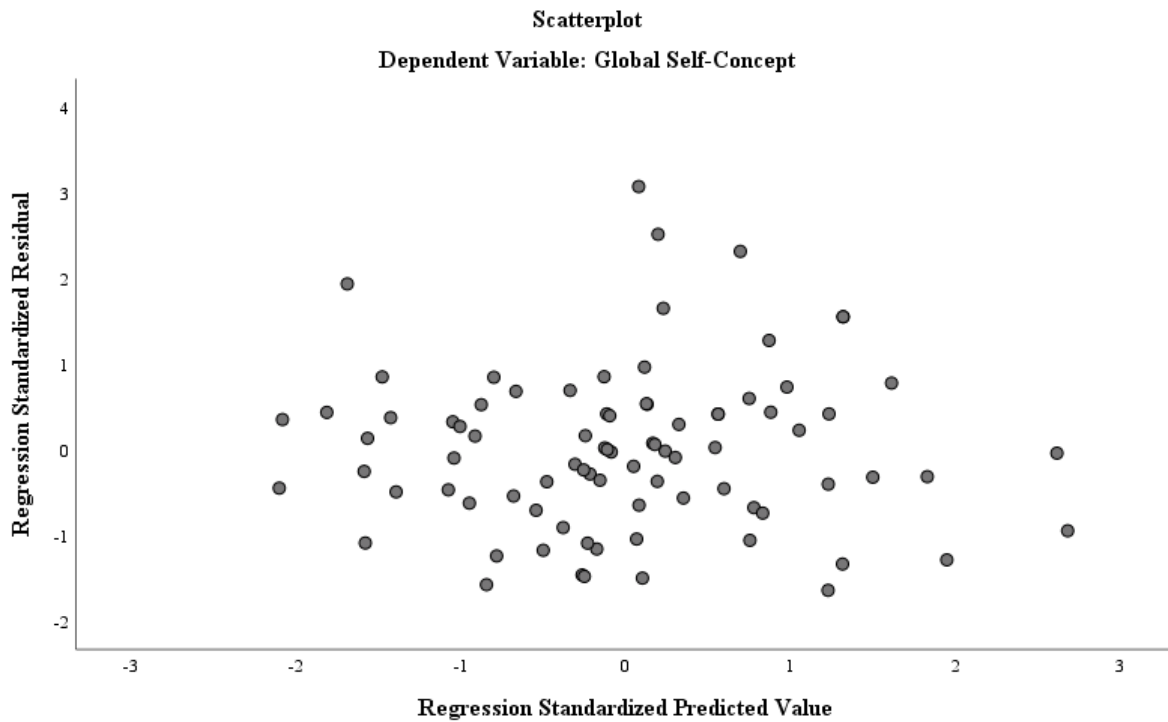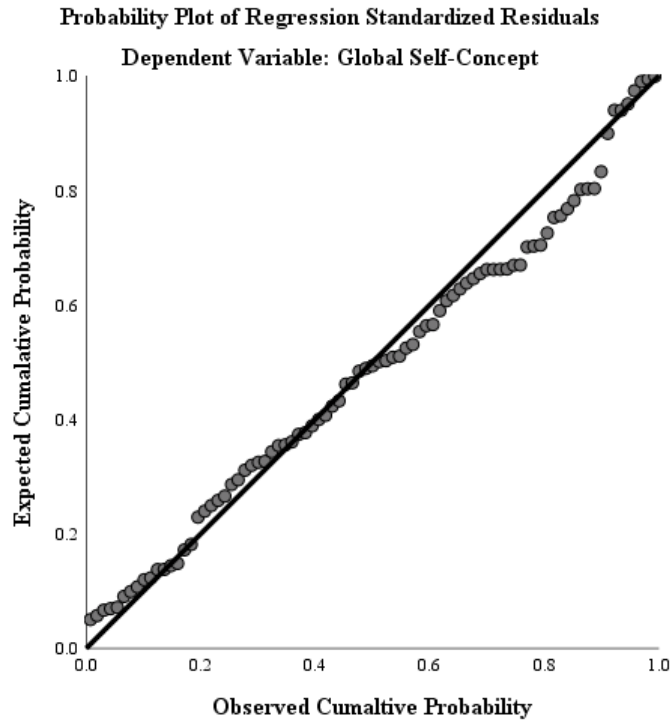
Appendix P: Summary of Indirect Mediation Effects

Attribute	SNS Intensity				Duration of SNS Use			
			95% CI				95% CI	
	Effect	*SE*	*LL*	*UL*	Effect	*SE*	*LL*	*UL*
Scholastic Competence	-.17	.03	-.08	.04	.00	.00	-.00	.00
Social Competence	-.02	.04	-.09	.06	-.00	.00	-.00	.00
Athletic Competence	.02	.02	-.02	.07	.00	.00	-.00	.00
Physical Appearance	.05	.03	-.00	.10	.00	.00	-.00	.00
Job Competence	-.02	.03	-.08	.05	.00	,00	-.00	.00
Romantic Appeal	-.01	-.03	-.07	.04	-.00	.00	-.00	.00
Behavioural Conduct	.00	.03	-.05	.07	-.00	.00	.00	.00
Close Friendships	-.02	.03	-.09	.04	.00	.00	-.00	.00

Note. CI = confidence interval; *LL* = lower limit, *UL* = upper limit.

Appendix Q: Summary of Moderation Analyses

Motivation	SNS Intensity				Duration of SNS Use			
	Coeff.	*SE*	*t*	*p*	Coeff.	*SE*	*t*	*p*
Talk to friends/family	-1.55	.88	-1.77	.08	-.01	.01	-1.69	.09
Feel involved	-.15	.13	-1.11	.27	.00	.00	.47	.64
Share Content	.05	.14	.35	.73	.00	.00	.20	.85
Post Status Updates	.31	.33	.92	.36	.00	.00	1.83	.07
Follow Celebrities	.16	.13	1.24	.22	.00	.00	.02	.98
Check In	.33	.28	1.16	.25	.00	.00	1.50	.14
Connect with others	-.17	.15	-1.17	.25	-.00	.00	-.06	.96
Inspiration	-.01	.13	-.09	.92	.00	.00	.68	.50
News	.12	.13	.94	.35	.00	.00	.80	.43
Entertaining Content	-.10	.15	.66	.51	.00	.00	.70	.48
Dating	.22	.21	1.03	.31	-.00	.00	-1.13	.26
Meet New Friends	.10	.19	.54	.59	-.00	.00	-.47	.64
Browse/Time-waste	-.19	.13	-1.48	.14	.00	.00	.50	.62