“My presence is there to be seen for people who judge”

Instagram on well-being, body image and Body Dysmorphic Disorder

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Statement of Contribution of Others

Where the work presented in this thesis was the product of collaborative efforts, I declare that my contribution was substantial and prominent, involving the development of original ideas, as well as the definition and implementation of subsequent work. Detailed information about my contribution to collaborative work in this thesis is outlined in Appendix I.

Dedication

This work is dedicated to my parents, Robert and Norma Ryding.

Your unconditional love, support, and encouragement has been the source of my inspiration and motivation throughout my PhD journey. I couldn't have done it without you!

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List of Publications

Peer-Reviewed Journal Articles

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Conference papers

Ryding, F.C., Harkin, L.J., & Kuss, D.J. (2021). *Instagram engagement in young adults: A qualitative exploration of Instagram, body image and well-being.* Presented at the Cyberpsychology Section Annual Conference 2021.

Ryding, F. C., & Kuss, D.J. (2019). *The addictive use of social networking sites, body image dissatisfaction and Body Dysmorphic Disorder: A review of psychological research.* Presented at the 6th International Conference on Behavioural Addictions, Japan, June.

Ryding, F.C., & Kuss, D.J. (2019). *The use of objective assessments in smartphone addiction: A systematic review*. Presented at the 2nd Annual British Psychological Society Midlands Conference, September.

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Abstract

As social networking site (SNS) use has become increasingly integrated within our daily lives, there is growing concern around the potential impacts SNS use may have on our well-being and body image. However, the interplay between SNS and well-being is complex, and much research continues to rely on self-report measures to capture experiences with SNS. Moreover, previous associations between SNS and body image dissatisfaction point to SNS as playing a role within Body Dysmorphic Disorder (BDD). Therefore, the present project aimed i) to investigate the role of SNS usage patterns on psychological well-being outcomes and ii) to identify and understand the features of SNS use that may influence well-being outcomes from the perspectives of Instagram users, individuals experiencing BDD and clinicians working in the field of BDD, taking a focus on the SNS platform Instagram. A multistage mixed methods approach was employed, implementing psychometric assessment, focus groups and interviews, in addition to ecological momentary assessment (EMA) with objective monitoring. The results of the empirical studies found: i) SNS as combining aspects of both offline and online peer and media influences, whereby appearance is endorsed through interactive features and influential figures on Instagram, ii) appearance anxiety as significant mediator for Instagram use and well-being outcomes, iii) Instagram usage time, number of notifications and number of Instagram launches are not associated with well-being outcomes, iv) Instagram is a platform wherein BDD behaviours are reinforced, but also a place for finding support and connections, and v) Instagram use may contribute towards maintaining BDD symptoms, but may also be a useful tool in therapeutic treatment. Overall, findings of the present project address the features of Instagram that can contribute towards well-being, body image and SNS behavioural patterns, whilst also contributing to knowledge and understanding around SNS use in BDD.

PART I: GENERAL INTRODUCTION
CHAPTER 1

1.1 Overview

The advent of social networking sites (SNS) has revolutionised the way people communicate worldwide, becoming integrated into our daily lives. Within the landscape of westernised SNS use, SNS provide the opportunity to maintain relationships with peers and family, in addition to building and expanding new relationships with others (Su & Chan, 2017). SNS can also provide a space for support, information and entertainment (Ziebland & Wyke, 2012; Jeong et al., 2016), creating a dynamic, interactive and engaging environment for consumers. However, SNS use has also been linked to problematic use (i.e., excessive use of SNS) (Panova & Carbonell, 2018; Azizi et al., 2019), in addition to concerns around psychological well-being and body image (Cohen & Blaszczynski, 2015; Holland & Tiggemann, 2016).

Due to the multidimensional facets of peer interaction, photo sharing, and accessibility to content, SNS can enable the promotion of body image ideals (Holland & Tiggemann, 2016). This has been linked to reports of body image dissatisfaction in individuals, which may result from the internalisation of appearance ideals, self-objectification and appearance comparisons (Cohen et al., 2017). Body image dissatisfaction is defined as the negative evaluation and attitude of one's physical appearance (Heider et al., 2018), and encompasses the perceived discrepancy between an individual's actual body image and the desired ideal body image (Cash, 1990; Alharballeh & Dodeen, 2021). It has also been shown to be associated with different mental disorders such as anxiety and depression (Manaf et al., 2016; Vannucci & Ohannessian, 2018), in addition to the development of body image-based disorders (Brechan & Kvalem, 2015; Yamamotova et al., 2017).

One body-image based disorder that encompasses body dissatisfaction is body dysmorphic disorder (BDD). BDD is classed as an obsessive-compulsive disorder, characterised by the persistent and excessive preoccupation with a perceived flaw in appearance (Krebs et al., 2017). That is, individuals with BDD spend hours thinking about their appearance and perceived flaw, frequently engaging in behaviours and rituals that improve or hide the features of concern (Schulte et al., 2020). Current prevalence estimates of BDD range between 1.7% – 2.9% (Rief et al., 2006; Buhlmann, 2010; Veale et al., 2016) within a general population, although prevalence rates have been shown to vary in different samples, for instance within student populations (3.3%), psychiatric settings (7.4%) and military populations (9.5%) (Veale et al., 2016; Drüge et al., 2021). Regarding gender, variability of BDD prevalence has also been shown. It has been demonstrated that BDD may be more common in females (Bulhmann et al., 2010), however, it has also been indicated to affect a large proportion of males, particularly within cosmetic and dermatological settings (Veale et al., 2016). Regarding appearance concerns, both males and females have been shown to be most concerned about skin, mouth, lips and teeth (Malcolm et al., 2021). Females, however, have been shown to also possess significant concerns about their legs (calves and/or thighs) in comparison to males, whilst males have been indicated to have more concerns around muscularity and body build (Malcolm et al., 2021). This appearance preoccupation can impair social and academic or occupational functioning, which can lead to a poor quality of life, social isolation or being housebound (Phillips et al., 2005; Mataix-Cols et al., 2016; Singh & Veale, 2019). It has also been shown that individuals living with BDD are over two times more likely to engage in suicide attempts in comparison to individuals without the disorder (Angelakis et al., 2016). Despite the impact BDD can have on individuals, there remains a paucity of research around the disorder, with awareness of BDD being lower than comparably less common mental disorders such as anorexia nervosa or schizophrenia

(Schulte et al., 2020). Moreover, in regard to SNS use, it has been indicated that SNS may facilitate the negative evaluation of appearance and may lead to maladaptive appearance cognitions (Nolen-Hoeksema et al., 2008; Tiggemann & Zaccardo, 2015). Given that BDD encompasses the negative evaluation of physical appearance, SNS may influence the experiences and perceptions of SNS users who also live with and experience the BDD. Thus, the present project aims to further understand SNS engagement in the area of body image and BDD.

1.2 Problem statement

There has been a large body of literature highlighting associations between SNS use, body dissatisfaction and distorted appearance cognitions (Ridolfi et al., 2011; Hanna et al., 2017). Perceived pressure from peers, family and the media to conform to appearance ideals may lead individuals to internalise these ideals as being their personal standard that is central to their self-worth and important to attain (Vannucci & Ohannessian, 2018). This can ultimately cause individuals to compare themselves to others in accordance with their internalised ideals, eliciting body image dissatisfaction due to the inability to achieve appearance ideals (Vannucci & Ohannessian, 2018; Fatt et al., 2019). However, as aforementioned, much research that has investigated the role of SNS and body image has predominantly focussed on body dissatisfaction rather than BDD (e.g., Kim & Chock, 2015; Wang et al., 2017). Whilst research into SNS and body image dissatisfaction has investigated how SNS may influence body perception (e.g., Tiggemann & Slater, 2017; Marengo et al., 2018), this often remains limited to measures around screen time, which may be too broad to identify the nuances of SNS that may contribute to body image dissatisfaction (Kaye et al., 2020). Moreover, considering the impacts that BDD can have on individuals with the disorder, it is pertinent to explore how specific features of SNS platforms may impact on body perception and

associated well-being outcomes. Therefore, the present project seeks to address these research gaps in the empirical literature by establishing features of SNS (beyond screen time) that may influence body image dissatisfaction and well-being within a non-clinical population, in addition to identifying SNS features that may contribute to the potential development and maintenance of BDD.

1.3 Significance of the project

This research will provide new insights into the role of SNS engagement in body image, BDD and psychological well-being. Differential outcomes of well-being may be associated with both SNS use and body image dissatisfaction (e.g., Twenge & Campbell, 2018; Vanucci & Ohannessian, 2018; Stiglic & Viner, 2019), and was investigated within the present project to establish the relationship between specific SNS features and outcomes of well-being. The SNS platform Instagram will be of particular focus throughout this project as it has been proposed to have the most detrimental impact on appearance dissatisfaction (Cohen et al., 2017; Tiggemann & Anderberg, 2020). That is, in comparison to more text-centred SNS platforms such as Facebook, the photo-based environment of Instagram may amplify appearance-based images and encourage the self-evaluation of appearance in Instagram users (Kim, 2020). As such, Instagram may lead to higher levels of negative self-image and lower outcomes of psychological well-being in comparison to its text based SNS counterparts. This project takes a novel approach by employing both self-report and qualitative methods to understand the complexities of Instagram behaviour and psychological well-being. Alongside quantitative and qualitative data collection, a bespoke application 'DiaryMood' was also developed and utilised as part of the project to objectively capture Instagram users' usage and well-being patterns. In this regard, this project provides a unique insight into implementing technology within SNS research. Moreover, findings of this research can benefit (i) health

practitioners by providing valuable information on the functions and motivations behind BDD individuals SNS use, in addition to features of Instagram that may influence BDD symptoms, and (ii) corporate SNS companies, by identifying the content and features of Instagram that may contribute to the detriment or enhancement of psychological well-being and appearance perception.

1.4 Structure of thesis

The succeeding systematic review chapters outline the evidence base for SNS in the context of body image and BDD. These were conducted to elucidate the potential factors of SNS that may be associated with body image dissatisfaction and BDD, in addition to reviewing and identifying specific features of SNS that may contribute to well-being outcomes. Following this, a mixed-methods approach was designed to address the gaps in knowledge identified within the systematic reviews. The empirical studies that were conducted for the present project are then presented, before being synthesised and discussed to provide a comprehensive and holistic overview of SNS, and its role in body image, BDD and psychological well-being. As such, the thesis is divided into five main sections:

Part I: General introduction

This chapter provides an overview of SNS, body image dissatisfaction and BDD, in addition to outlining the problem statement and significance of the present project.

Part II: Systematic reviews

The introductory chapters provide an overview of existing evidence in the area of SNS, body image and well-being to highlight the gaps in knowledge. This section is formed of two systematic reviews. The first review aimed to investigate different SNS usage patterns, the features of SNS that may contribute to body image dissatisfaction, and the factors that may

facilitate and maintain body image concerns. The second review aimed to identify objective measures that assess smartphone usage in addition to summarising the characteristics, strengths, and limitations of objective measures for assessing smartphone use.

Part III: Methodology

The methodology section provides an overview of the mixed method design and philosophical positions employed for the present project. A discussion of the different paradigms is provided, alongside a justification of the chosen research strategy used to collect and analyse the different forms of data collected within the present project.

Part IV: Empirical studies

The third part of this thesis consists of the empirical studies conducted for the present study, and is divided into five chapters:

Chapter 5: A mixed methods exploration into the role of Instagram use on body image and well-being. This study employed a sequential mixed-methods approach, which aimed to explore the role of SNS use in body image and well-being in a non-clinical, adult population whilst also seeking to identify the specific features of Instagram that may impact body image and well-being.

Chapter 6: Instagram engagement and well-being: The mediating role of appearance anxiety. This study utilised a cross-sectional design, which aimed to investigate the relationship between active, passive and problematic SNS usage on anxiety, depression and appearance anxiety outcomes, in a non-clinical adult population.

Chapter 7: Investigating Instagram engagement through 'DiaryMood': An application-based study employing ecological momentary assessment and passive objective

monitoring. This study aimed to investigate Instagram usage patterns and well-being utilising an objective smartphone measure.

Chapter 8: Instagram engagement in BDD: An exploration of the experiences using Instagram with Body Dysmorphic Disorder. The fourth study aimed to explore how individuals experience using SNS whilst living with BDD.

Chapter 9: Making sense of social networking sites in Body Dysmorphic Disorder: The clinician's perspective. This study aimed to explore how clinicians in the field of BDD make sense of SNS for people with BDD.

Part V: General discussion

The final section of this thesis synthesises and discusses the findings of the empirical studies. Limitations and conclusions are discussed, in addition to the implications and unique contributions of the project. Together, the empirical studies will provide a comprehensive and holistic overview of SNS and psychological well-being, through the integration of quantitative, qualitative and objective methods.

PART II: SYSTEMATIC LITERATURE REVIEWS

CHAPTER 2

The use of social networking sites, body image dissatisfaction and Body Dysmorphic Disorder: A systematic review of psychological research

The present chapter presents the first systematic literature review conducted for the present project. This review focussed on previous studies conducted that have investigated the influence of SNS on body image, BDD and well-being. This study was critical to develop an understanding of the features of SNS that may contribute towards body image dissatisfaction, and to identify the features that may contribute towards BDD symptomatology.

2.1 Introduction

Through the proliferation of smartphones and improved internet connectivity, the use of social networking sites (SNS) has become an integral part of individual's lives (Ho et al., 2017). Indeed, recent research has indicated that the average time spent on SNS, such as Facebook, is approximately two hours per day (Fardouly & Vartanian, 2015; Brunborg & Andreas, 2019), compared to the average time of 45 minutes per day reported over a decade ago (Tiggemann & Miller, 2010). It has been indicated that 88% of 18-29 year olds use SNS, in comparison to 78% for those aged 30-49, 64% among those aged 50-64 and 37% for Americans aged 65 and older (Smith & Anderson, 2018), indicating that young adults are the most active users on SNS. As a result, there has been increasing concern in the rise of both excessive and problematic SNS use, indicating an increased amount of time spent on SNS, preoccupation with SNS, as well as the inability to control SNS use, which results in a detrimental impact on the users' life (Kuss & Griffiths, 2017; Ho et al., 2017).

Currently, much research documents prevalence of SNS use such as minutes spent online daily, or frequency of checking SNS (Scott et al., 2017). This may not reflect the subjective meaning of SNS use for individuals. That is, the way individuals engage on SNS is a dimension that is important to understand, particularly as there are multiple ways to engage, such as responding to others' content, and uploading personal content (Scott et al., 2017). Indeed, the flexibility of engagement on SNS has been shown to play an important role in well-being (Chen et al., 2016). This evidence highlights the need to explore facets of SNS engagement, including the distinction between active and passive use, in relation to the impact it may have on users (Young et al., 2017).

It has been demonstrated that active use, where SNS users engage and communicate with other online users through the commenting and liking of posts, is more likely to have a positive effect on psychological well-being (Ghosh & Dasgupta, 2015). The supportive interactions that can be maintained through SNS can lead to enhanced feelings of belongingness and increased self-esteem (Oh et al., 2014) as it supports social connectedness and identity expression (Ghosh & Dasgupta, 2015; Weinstein, 2017). In contrast however, passive use, such as scrolling through profiles, has been demonstrated to be particularly detrimental to well-being, as often the content encountered through browsing constitutes the favourable self-presentations of others (Lup et al., 2015; Weinstein, 2017). It has been demonstrated that individuals who view subjectively attractive images on Facebook are more likely to be dissatisfied with their own body image, in addition to feeling more negative emotions afterwards (Haferkamp & Krämer, 2011; Ridolfi et al., 2011). Such negative comparison has been found to increase the risk of rumination in individuals, leading to maladaptive cognitions, such as self-criticism and dysfunctional attitudes (Nolen-Hoeksema et al., 2008), decreased self-esteem and experiencing symptoms of depression and addiction

(Donnelly & Kuss, 2016), indicating that the differential outcomes of well-being are dependent on the way SNS users engage with SNS platforms when online.

One psychological impact of increased SNS use is body image dissatisfaction: the negative evaluation of one's physical appearance (Cohen & Blaszczynski, 2015). Previous research has consistently demonstrated that exposure to media images of the thin ideal in traditional forms of media (i.e., television and magazines) results in body image concerns and eating disturbances in women, in addition to body dissatisfaction in men (Daniel & Bridges, 2010; Tiggemann & Slater, 2013). More recently however, research has investigated the role of SNS and its relationship with body image dissatisfaction. In particular, with the multidimensional factors of photo sharing, peer interactions and mobile technology accessibility, there are many platforms online that promote body image ideals due to the highly visual environment of SNS (Holland & Tiggemann, 2016). Indeed, a systematic review of 20 studies by Holland and Tiggemann (2016) investigated the relationship between SNS, body image and disordered eating, providing evidence that SNS use, in particular appearance-based SNS use, is associated with increased body dissatisfaction and disordered eating. Many studies exploring this relationship are correlational however (Smith et al., 2013; Kim & Chock, 2015), therefore due to the cross-sectional nature of these studies, causal inferences cannot be drawn and it is likely that a bidirectional relationship exists between SNS engagement and body image dissatisfaction. Whilst experimental studies have demonstrated that exposure to the SNS Instagram images results in greater body dissatisfaction (Tiggemann & Zaccardo, 2015), this indicates that further longitudinal studies and experimental research are needed to examine this relationship. Nevertheless, such research indicates that SNS provide users with the probability to engage in increased appearance comparisons, internalisation of the thin ideal and self-objectification, leading to body dissatisfaction (Chen et al., 2017).

Following this, appearance comparison is one mechanism that has been highly implicated in the development of body image dissatisfaction. In terms of SNS usage, it has been demonstrated that women are more likely motivated to use SNS to compare themselves with others to adapt and develop their own self-image and self-presentation (Haferkamp et al., 2012). Indeed, research has shown that appearance comparisons in general mediate the relationship between Facebook use and body image dissatisfaction in females (Fardouly & Varanian, 2015), indicating that SNS use may facilitate the development of body image concerns. However, it has been highlighted that the direction of comparison plays a role in mediating body image concerns. Upward comparisons in particular (comparing oneself with individuals perceived to hold superior positive characteristics) have been shown to be associated with greater body image dissatisfaction as opposed to downward comparisons (comparisons to those perceived as inferior to oneself) (Ridolfi et al., 2011; Kim & Chock, 2015), as individuals are less likely to be satisfied with themselves when comparing their appearance with perceived ideals (Kim & Chock, 2015).

Passive SNS use has also been related to upward social comparison, which is consequently associated with lower self-evaluation and subjective well-being (Wang et al., 2017), as this provides greater opportunities for comparison when viewing others' images and posts (Kim & Chock, 2015). Such research surrounding body image concerns and comparisons however has focussed predominantly on females (Daniel & Bridges, 2009), and it has been suggested that young women in particular may be more likely to engage in photo-based activities on SNS, which may consequently reinforce body image concerns (Perloff, 2014). Exposure to SNS trends surrounding "fitspiration" and "thinspiration" (whereby images surround the promotion of thinness [losing weight] and fitness [exercise and health], respectively) have been demonstrated to lead to greater body image dissatisfaction (Tiggemann & Zaccardo, 2015) and greater internalisation of the thin ideal (Fardouly, et al., 2017), which may be

attributed to using these image types as aspirational targets for thin and more toned body ideals for comparison. However, it has also been demonstrated that SNS use predicts an increase in male appearance comparisons (Rousseau et al., 2017). Whilst further research is needed to capture the male experience of body image disturbance on SNS, it has been shown that men are more likely to have greater internalisation of the muscular ideal when viewing content associated with fitspiration, resulting in greater appearance comparisons and poorer body satisfaction, compared to the internalisation of the thin ideal that is seen in women (Fatt et al., 2019). Such literature suggests that while there may be gender differences in the perception of idealised body type, the nature of engagement and the features of SNS use may be associated in the development and maintenance of body image dissatisfaction.

Whilst a number of studies investigate the relationship between SNS use and body image dissatisfaction, there remains a paucity of research surrounding SNS usage and Body Dysmorphic Disorder (BDD), as discussed in Chapter 1. BDD is currently classified within the Diagnostic and Statistical Manual of Mental Disorders (5^{th} ed.; DSM-V, American Psychiatric Association, 2013) as an obsessive-compulsive disorder, characterised by excessive concern about physical appearance, specifically a persistent preoccupation with a perceived defect, which results in significant distress and the impairment of interpersonal situations (Bartsch, 2007). Symptoms include safety behaviours, such as seeking reassurance from others and comparison to others in response to appearance concerns (Kelly et al., 2013). Such symptomatology is also parallel with the behaviour individuals with high body dissatisfaction exhibit, which has consequently been shown to lead to further negative appearance evaluation (Lambrou et al., 2012). In relation to SNS, this suggests that those who engage in appearance comparisons online may experience an increase in negative appearance evaluation and therefore the likelihood of developing BDD symptomatology through frequent and repetitive SNS use. Moreover, research has indicated there to be an association between

the overuse of SNS and obsessive-compulsive disorder (OCD; Andreassen et al., 2016), and it has been suggested that the addictive behaviours displayed in those presenting OCD symptomatology can be conceptualised as a coping mechanism for the symptoms expressed (Lieb, 2015), which may be likened to the safety behaviours exhibited in BDD. However, although BDD is dominantly conceptualised as an obsessive-compulsive disorder, there is a dearth of literature that specifically explores SNS and BDD. This highlights the need for further research in the relationship between SNS usage and the development of BDD symptomatology.

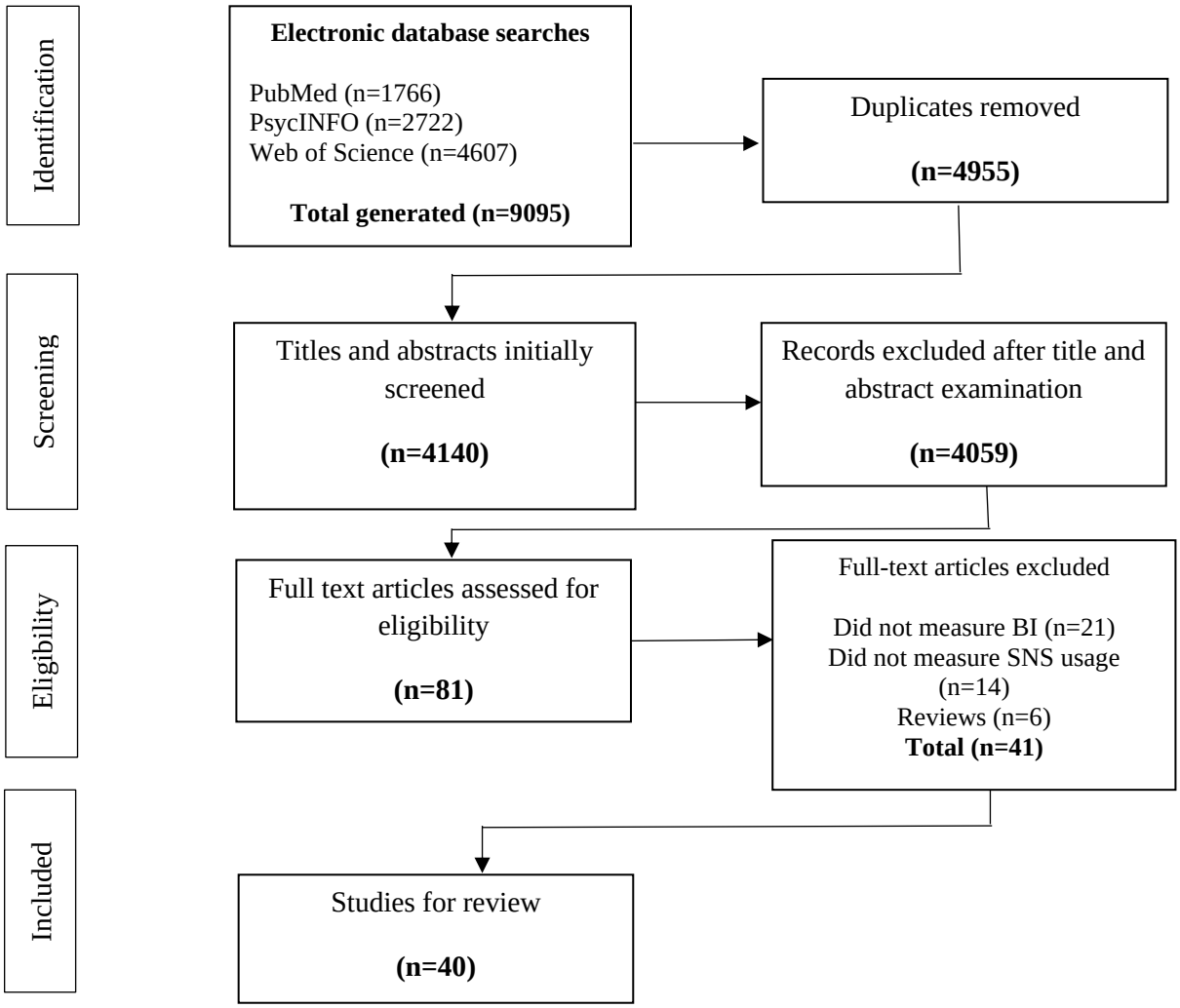
The present chapter aims to systematically review the research that has investigated the influence of SNS use on body image dissatisfaction. In particular, it seeks to advance upon Holland and Tiggeman's (2016) systematic review, taking a focus on the impact of excessive SNS use on body image dissatisfaction and how this may lead to the development and presentation of BDD symptomatology. This chapter also aims to review studies investigating features of SNS (passive and/or active) and the relationship with body image. Furthermore, since much research has focussed on body image dissatisfaction in general, it is arguable that this prohibits the specific awareness and potential diagnosis of BDD, which may consequently affect prevalence rates. To provide further insight into this issue, this review also aims to investigate (i) SNS usage frequency and patterns, (ii) the features of SNS that may contribute to the development of body image dissatisfaction, and (iii) the mediating factors that may facilitate and maintain body image concerns, to provide further understanding of the factors of SNS that may result in differential outcomes for well-being, body image concerns and BDD symptomatology.

2.2 Method

The review process was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis statement (PRISMA; Moher et al., 2009). To identify papers for review, an extensive search was performed using Web of Science, PsycINFO and PubMed databases. These databases were searched using a combination of the following search terms: (social networking site* OR social media OR Instagram OR Facebook) AND (body image OR body dissatisfaction OR dysmorphia OR body dysmorphic disorder); (social networking site* OR social media OR Instagram OR Facebook) AND (self-esteem OR comparison*). References of collected articles were also scanned for additional studies. Studies were included if they (i) included empirical data, made reference to at least one measure of (ii) SNS use (either general or specific SNS), (iii) features of SNS use (active /passive), as well as at least one measure of (iv) body image and (v) body dysmorphic disorder. Since the primary focus of this review was on body image dissatisfaction, articles that addressed other well-being constructs (e.g., anxiety and self-esteem) were only included if they also made specific reference to body image. Studies were excluded if they were written in languages other than English. Reviews, commentaries, book chapters, published abstracts and articles that have not been peer reviewed (e.g., dissertations) were also excluded. The title and abstract of each study were screened for eligibility. Full texts of potentially relevant studies were consequently retrieved and examined for eligibility. The search strategy is detailed in Figure 2.1.

Figure 2.1

Search strategy of the SNS and body image study selection process



2.3 Results

A total of 9095 studies (PubMed *n*=1766; PsycINFO *n*=2722; Web of Science *n*= 4607) were initially identified. Identified duplicates were removed (*n*=4955), leaving 4140 studies for evaluation. The title and abstracts of these papers were screened, resulting in the exclusion of 4059 that were of no relevance, and a total of 81studies which were eligible for further review. A further 41 papers were consequently excluded as they did not contain a measurement for body image (*N*=21), did not measure social networking site usage (*n*=14), or they were review papers (*n*=6). Information that was extracted from each study focussed primarily on (i) sample characteristics (e.g., study size, age, sex and geographical location), (ii) methodology used, including measures implemented (e.g., measures of SNS use and body image) and (iii) underlying processes mediating the relationship between variables (e.g., comparison and self-esteem). A total of 40 studies were consequently identified as relevant from the literature. These studies are presented in Table 2.1.

Current SNS usage rates will be presented within the first section of the results, in particular highlighting the average time spent online, in addition to outlining excessive and addictive SNS usage. Following this, the relationship between SNS use and body image concerns will be summarised, in addition to the features of SNS that have been found to mediate the relationship between SNS usage and levels of body image dissatisfaction. Further mediating factors in the relationship between SNS use and body image dissatisfaction will be outlined in the final section, before parallels between body image dissatisfaction and BDD are discussed in the context of SNS.

Table 2.1

Overview of included SNS and body image studies

Author	Design and Sample	Measures	Aims	Findings
Brichacek, Neill & Murray, (2018)	Between subjects experimental design. *N*=189 university students from University of Canberra (mean age= 22.6, *SD*=6.6; 75% female).	Six images presenting body image ideals, and a travel image as a control image. 12 satisfaction items from Basic Psychological Need Satisfaction and Frustration Scale. The Body Image States Scale.	To investigate whether the protective role of psychological need satisfaction transfers to university students when viewing Facebook images depicting an ideal body type.	Viewing Facebook images depicting body image ideal resulted in lower body satisfaction, in comparison to a travel image.
Choukas-Bradley, Nesi, Widman & Higgins (2018)	Within subjects design; survey. *N*=339 females from a southeastern United States university (mean age 18.35).	Self-report on time spent on social media. Items developed to examine ASMC. Body surveillance subscale of the objectified body conscious scale. Body Comparison Orientation Scale of the Body, Eating and Exercise Comparison Orientation Scale of the Body, Eating and Exercise Comparison Orientation Measure.	To examine how frequently women engage in appearance- related social media consciousness (ASMC).	Women endorsed high levels of ASMC, which was also associated with higher body surveillance, body comparison, low self-esteem and time spent on social media.

		Body Esteem Scale for Adolescents and Adults (BESAA). 13 Item Short Mood and Feelings Questionnaire (for depressive symptoms).		
Cohen & Blaszczynski (2015)	2x2 mixed design. Between group factor was type of exposure, within group factor was pre- and post-exposure. Dependent variables were appearance comparison and body image dissatisfaction. *N*=193 female university students from University of Sydney (mean age=19.32, *SD*= 3.47).	Facebook stimuli: mock profile images. Conventional media stimuli: thin ideal commercial images of models/celebrities with themes matched to those in the Facebook profiles. Self-report on type of Facebook use and time spent on Facebook. 7 item pressure subscale from SATAQ-V3 used to assess pressure from media to attain thin ideal. Rosenberg Self Esteem Scale. The Body Areas Satisfaction Scale (BASS). 3 Item Extent Thoughts Questionnaire used for appearance comparison. The Eating Attitudes Test-26 used for ED risk.	To determine whether the relationship between appearance comparison and body image dissatisfaction would be stronger for those exposed to social media images compared to conventional media images.	Type of exposure was not found to moderate the relationship between appearance comparison and body image. Facebook was found to predict higher baseline body image dissatisfaction.
Cohen, Newton-John & Slater (2017)	Within subjects design; survey.	The Facebook Questionnaire.	To identify the specific SNS features that relate to body	Appearance focussed SNS use, rather than overall SNS use was related to body image concerns in young women. Greater

	N=259 Australian women (mean age 22.97, *SD*=3.89).	The Internalisation-General subscale of the Sociocultural Attitudes Towards Appearance Questionnaire-Version 3 to measure thin ideal internalisation. The Physical Appearance Comparison Scale. The Appearance Evaluation subscale of the Multidimensional Body Self-Relations Questionnaire Appearance Scales The Body surveillance Subscale of the Objectified Body Consciousness Scale. The Drive for Thinness Subscale of the Eating Disorder Inventory-3.	image concerns in young women.	engagement in photo activities on Facebook, but not general Facebook use was associated with greater thin deal internalisation and body surveillance. Instagram was associated with thin ideal internalisation, body surveillance and drive for thinness, whereas appearance neutral accounts was not associated with any body image outcomes.
Daniel & Bridges (2010)	Within subjects design; survey. *N*=244 male college students from Southern US (mean age 21.35, *SD*=3.81).	Sociocultural Attitudes Towards Appearance Questionnaire. Self-Objectification Questionnaire. Objectified Body Consciousness Scale. Drive for Muscularity Scale.	To examine the applicability of objectification theory to men, taking account internalisation of media standards and its effects on male body image, in terms of male drive for muscularity.	Internalisation of media ideal was the strongest predictor for the drive for muscularity and BMI

Eckler, Kalyango, Yusuf & Paasch (2017)	Cross sectional study; within subjects design. *N*=770 women from a Midwestern university in the US (mean age 23.83, *SD*=7.26).	Self-report on time spent on Facebook and activities on Facebook. Self-report on history of eating behaviour. Comparison was measured by questions asking about comparison on own body to those of friends. Attention to physical appearance-asked how much attention paid to dress and body. Body Shape Questionnaire. 26 Item Eating Attitudes Test.	To examine the relationship between time spent on Facebook and body image, using the social comparison theory.	More time on Facebook was related to more frequent body and weight comparisons, more attention to the physical appearance of others and more negative feelings about their bodies.
Fardouly & Vartanian (2015)	Survey; within subjects design. *N*=227 young adult females from an Australian university (mean age 19.13, *SD*=2.21).	2 questions regarding time spent during the day, and amount of time checking Facebook were used to assess Facebook usage. 3 statements from Physical Appearance Comparison Scale (modified for comparison on Facebook). Frequency and direction of appearance comparisons measured on likert scale of 5 and 6 respectively. 2 subscales of the Eating Disorder Inventory were used to assess individuals concerns with body	To investigate the relationship between the frequency of Facebook usage and body image concerns among female university students, and to examine whether appearance comparisons in general or to target groups on Facebook account for this relationship.	Frequency of Facebook usage showed a positive association with body image concerns, which was mediated by appearance comparisons in general.

		weight and shape: the body dissatisfaction subscale and drive for thinness subscale.		
Fardouly, Deiedrichs, Vartanian & Halliwell (2015)	2-part study with between subjects experimental design. **Time 1** participants randomly assigned to one of 3 conditions of which they were asked to browse one of the following websites for 10 mins: their own FB account, a fashion magazine website, or an appearance neutral control website. **Time 2** participants completed an online survey containing a trait measure of appearance comparison tendency.	Computer based visual analogue scales (VAS) used to measure state negative mood and body dissatisfaction both before and immediately after browsing assigned website. State version of self-discrepancy index (SDI) used to measure weight and shape related appearance discrepancy, as well as face, hair and skin related appearance. The Upward and Downward Appearance Comparison Scale. *Naturalistic study.	To investigate the effect of Facebook usage on women's mood and body image, and whether these effects differ from an online fashion magazine, and whether appearance comparison moderates these effects.	Individuals who spent more time on Facebook reported more negative mood than those who spent time on the control website. Women high in appearance comparison tendency reported more facial, hair and skin related discrepancies after Facebook exposure.

	N= 112 female and staff members from a UK university (mean age 20.46, *SD*= 1.71).			
Fardouly, Diedrichs, & Hallowell (2015)	Cross-sectional design with online questionnaire. *N*=150 female university students and staff in the UK (mean age 20.52, *SD*= 1.73).	Participant asked to report how often they use a variety of different media types (e.g., Facebook; TV). The Upward and Downward Appearance Comparison Scale. Participants asked how often they compared their appearance to female target groups when looking at images on Facebook. The Self-Objectification Questionnaire.	To examine the relationship between the usage of different media types (online and traditional) and self-objectification; whether appearance comparison tendencies in general mediated any observed relationships; whether appearance comparisons to specific types of women on Facebook mediated any relationship between Facebook usage and self-objectification.	Facebook usage and magazine usage were positively correlated with self-objectification and these relationships were mediated by appearance comparisons in general. The relationship between Facebook use and self-objectification was mediated by comparisons to one's peers on Facebook.
Fardouly, Willburger & Vartanian (2018)	Within subjects design; survey.	Self-report to assess Instagram usage, how often they view fitspiration images on Instagram and frequency with which they compare appearance to specific female target groups on Instagram.	To determine whether Instagram usage was associated with young women's body image concerns and self-	Greater Instagram use was associated with greater body image concerns, and that this relationship was mediated by internalization, appearance comparison tendency in general,

	N=276 young women from the United States, recruited from MTurk and undergraduate students from an Australian university (mean age= 22.83, *SD*=3.57).	Internalization of the beauty ideal. The Upward and Downward Appearance Comparison Scale. The Eating Disorder Inventory. The Self-Objectification Questionnaire.	objectification. To also investigate whether internalisation of the beauty ideal, appearance comparison tendency in general, and/or appearance comparisons to specific target groups on Instagram mediated any relationship between Instagram usage and body image/ self-objectification.	and appearance comparisons to women in fitspiration images.
Feltman & Szymanski (2018)	Within subjects design; survey. *N*= 492 women enrolled in a U.S. Southern University (mean age= 18.50, *SD*= .85).	Instagram use measured by modified Facebook use measure. The Self-Objectification Questionnaire. Internalization subscale of the Sociocultural Attitudes Towards Appearance Questionnaire. The Upward and Downward Appearance Comparison Scale. Author created scale to assess for appearance commentary – Social Networking Appearance-Related Commentary Scale.	To examine the mediators, moderators and moderated mediation of the links between Instagram use and self-objectification and body surveillance.	Internalisation of cultural standards of beauty and engaging in appearance comparisons mediated Instagram usage, self-objectification and body surveillance links. Instagram usage on body surveillance was contingent on feminist beliefs.

		The Feminist Perspective Scale.		
Ghosh & Dagupta (2015)	Survey; Within subjects design. *N*=120 Hindu participants from Kolkata (18-35 years; 50% female). Both Facebook users and non-users: those with Facebook were included if they had used it for 1+years and was of high-average use.	General Health Questionnaire. Facebook Intensity Scale; measures active engagement and emotional connection. NEO Five-Factor Inventory; brief measure of the five domains of personality. Relationship Scales Questionnaire. Social Interaction Anxiety Scale. Rosenberg Self-Esteem Scale.	To examine the difference between Facebook users and non-users with respect to personality, attachment style, social interaction anxiety and self-esteem to explore the type of people who are more likely to use Facebook.	Facebook users were more extravert and open, while non-users were more conscientious. Facebook users also had high self-esteem and low interaction anxiety than non-users.
Haferkamp, Eimler, Papadakis & Kruck (2012).	Within subjects; survey. *N*=106 members of SNS StudiVZ (German	23 items were selected based on the uses and gratifications scale, with a focus on SNS use. Motivations to join SNS groups were measure by an 18 item self-constructed scale.	To assess user's motives for participating in SNS in general and their use of specific profile elements or	Women tend to be more likely to use SNS for comparing themselves with others and for searching for information, whilst men are more likely to look at other people's profiles to find friends, Women also tend to use group names for self-presentation and prefer

	equivalent of Facebook) (mean age23.12, *SD*=3.12; 49% female).	Participants asked about perception of other people's profiles using 17 items with 5-point likert scale.	self-presentation in particular.	adding portrait photos to their profiles, in comparison to men who choose full-body shots.
Hanna, Ward, Seabrook, Jerald, Reed, Giaccardi & Lippman (2017)	Within subjects design; survey. *N*=1167 University students from Michigan (mean age 19.27; 718 females).	Self-report on amount of time spent using Facebook. Passive and Active Facebook use assessed via scale between 0-5. Surveillance subscale of the Objectified Body Conscious Scale-Youth. Enjoyment of Sexualisation Scale. Sexual Appeal self-worth scale. State Self Esteem Scale. Iowa Netherlands Comparison Orientation Measure. Brief Symptom Inventory (BSI) for depression and anxiety.	To examine social comparison and self-objectification as mediators between Facebook use and depressive symptoms, anxiety, body shame and self-esteem.	Social comparison and self-objectification mediate the relationship between Facebook use and self-esteem, mental health and body shame.
Hawi & Samaha, (2017)	Within subjects; survey.	Social Media Addiction (derived from Facebook Intrusion Questionnaire) Questionnaire. Rosenberg Self-Esteem Scale.	To examine addictive use of social media in relation to self-esteem and satisfaction with life.	Addictive use of social media had a negative association with self-esteem, whilst self-esteem had a positive association with satisfaction with life. Self-esteem also

	N= 364 university students in Lebanon (mean age = 21.1, *SD*= 2.3; 52.2% male).	Satisfaction with Life Scale.		mediated the effect of social media addiction on satisfaction with life.
Hawi & Samaha, (2018)	Within subjects; correlational; survey. *N*= 512 university students, Lebanon (mean age = 21.23, *SD*= 2.47; 55.8% male).	Internet Addition Test (IAT). Social Media Addiction Questionnaire (SMAQ). Rosenberg Self Esteem Scale (RSES). The Satisfaction with Life Scale (SwLS). The Ten Item Personality Inventory (TIPI). The Self-Construal Scale (SCS).	To investigate the relationships between personality characteristics and both IA and SM addictions, to identify similarities and differences between the 2 addictions.	Commonalities outnumbered differences, which is in line with the significant high correlation between IA and SMA. SE, agreeableness, conscientiousness, openness to experiences, emotional stability, Internet usage and SM predicted both types of addiction. Gender predicted SM but not IA.
Hendrickse, Apran, Clayton & Ridgway (2017)	Survey; within subjects design. *N*=185 young females from United States (mean age 21.04, *SD*=3.55).	Instagram photo activity index (adapted from Meier and Gray) to assess extent to which users are exposed to ideal images of others whilst on Instagram. 3 items (adapted) from the Physical Appearance Comparison Scale. Intrasexual Competition Scale.	To examine the potential association between the appearance related comparisons made on Instagram and college women's body image, and to determine whether individual differences moderate the influence of Instagram photo based activity on appearance	Engaging in appearance related comparisons on Instagram was associated with a more intense drive towards thinness and greater body dissatisfaction. However, photo related activities on Instagram were not positively associated with outcome variables (but related *through* appearance comparisons).

		Eating Disorder Inventory (one subscale used to measure drive for thinness and another for body dissatisfaction).	related comparisons in the prediction of body dissatisfaction.	
Hogue & Mills (2019)	Within sample; survey. N= 125 female York University undergraduate students (mean age= 19.59, *SD* = 2.00).	VAS used to measure state overall appearance and body dissatisfaction. The average of both was then referred to as the State Body Image Scale. Social Media Interaction Questionnaire.	To investigate the effect of photo-based active social media engagement with peers on young adult women's body image.	Active social media engagement with attractive peers' appearance-based social media resulted in worsened body image in young adult women.
Jang, Park & Song (2016)	Survey; within subjects design. *N*=313 college students from private university in Seoul (mean age 21.17, *SD*= 1.95; 70% female).	Facebook use measured using questions surrounding frequency of posting/looking at post and usage. Iowa Netherlands Comparison Orientation Measure used to measure SCOF. Perceived social support measured by statements surrounding help from friends. RAND Mental Health Inventory used to assess mental health.	To examine the associations among Facebook use, social comparison orientation on Facebook (SCOF) and psychological outcomes represented by perceived social support and mental health.	There was a positive association between Facebook use and SCOF and perceive social support, but not significantly associated with mental health. There was a negative association between SCOF and mental health, and self-esteem and impression management were both positively associated with SCOF.

		Rosenberg Self Esteem Scale. Impression management measured using statements derived from measures of self-promotion and ingratiation self-impression management scale.		
Kalpidou, Costin & Morris (2011)	Within subjects design; survey. *N*= 70 undergraduate students from a Catholic, liberal arts institution in northeast America (mean age 19.61; 67% female).	Facebook Intensity Scale. Number of Facebook friends reported. 5-statement to assess how Facebook is used to make new connection. Rosenberg's Self-Esteem Scale. Student Adaption to College Questionnaire.	To investigate how Facebook use and attitudes relate to self-esteem and college adjustment.	Number of Facebook friends hinders academic adjustment, and spending a lot of time on Facebook is related to low self-esteem. Number of Facebook friends is negatively associated with emotional and academics adjustment in first year students.
Kleemans, Daalmans, Carbaat & Anshütz (2018)	Between subjects experimental design. *N*=144 adolescent girls in secondary education in Netherlands (mean age=15.92, *SD*=1.16).	Instagram photos as stimuli used (10 original and 10 manipulated). Body Image State Scale. Iowa-Netherlands Comparison Orientation Measure.	To investigate whether manipulated Instagram photos have negative effect on the body image of female adolescents and whether those with a higher tendency towards social comparison are more vulnerable to body image dissatisfaction.	Exposure to manipulated Instagram photos directly led to lower body image satisfaction.

Marengo, Longobardi, Fabris & Settanni (2017)	Within subject design; survey. *N*=523 adolescents between grades 6-11 from two secondary schools in Northern Italy (mean age 14.82, *SD*=1.52; 54% female).	Self-report on daily use of Facebook and HVSM. Body Shape Questionnaire (Italian version). Strength and Difficulties Questionnaire to assess internalising symptoms (Italian version).	To investigate the association between time spent on Highly Visual Social Media, body image concerns and internalising symptoms.	Individuals reporting frequent use of HVSM (>2h/day) reported significantly higher body image concerns and internalising symptoms than peers reporting no use of HVSM. There was also a positive link between use of HVSM and internalising symptoms to be mediated by participants body image concerns.
Meier & Gray (2014)	Within subjects design; survey. *N*=103 adolescent female students from a public high school in New York State (mean age 15.4).	Facebook Questionnaire (FBQ). 5 Item Sociocultural Internalisation of the Appearance Questionnaire for Adolescents (SIAQ-A). Physical Appearance Comparison (PACS). 8 item Weight Satisfaction subscale of the body esteem scale for Adolescents and Adults. The 7 Item Drive for thinness subscale of the eating disorder inventory. The 10 item self-objectification Questionnaire.	To identify specific Facebook features that are associated with body image disturbances in girls.	It is not the total time spent on FB or the internet, but rather amount of FB time allocated to photo activity that is associated with greater thin ideal internalisation, self-objectification, weight dissatisfaction and drive for thinness. Higher overall Fb use did not correlate with higher body image disturbance.

		Total Internet and Facebook use was measure by the FBQ developed by authors. This also assessed the frequency of user activity on specific FB features		
Muench, Hayes, Kuerbis & Shao (2015)	Within subjects design; survey. *N*=489 participants recruited through Amazon MTurk system- based in the U.S.A. (modal age 23-29; 66% female).	Time spent on Facebook and tome accessing Facebook assessed using self-report item specific to last 30 days. Brief Fear of Negative Evaluation Subscale used to measure fear of negative evaluations. Rosenberg Self-Esteem Scale. Social Comparison and FOMO measures. Facebook Addiction Scale (adapted with 3 additional items) surrounding interference in social life and activities, and difficulty controlling usage.	To examine the independent relationship of a brief Facebook addiction scale, time spent on Facebook, and Facebook checking on positive and negative social domains, while controlling for self-esteem and social desirability	Neither time spent on Facebook, nor Facebook checking was significantly associated with either self-esteem, fear of negative social evaluation or social comparison, whilst SNS addiction symptoms were each independently associated with Facebook usage. Neither time spent on Facebook nor SNS addiction symptoms were associated with positive social relationships.
Murray, Maras & Goldfield (2016)	Within subjects design; survey. *N*= 383 undergraduate university students from the University of Ottawa (mean age	Generalised Problematic Internet Use Scale. Dutch Eating Behaviour Questionnaire. Body Esteem Scale for Adolescents and Adults.	To examine the degree to which body image concerns mediate the relationship between excessive time on SNS and disordered eating behaviours.	Body esteem indicators mediate the relationship between SNS use. Greater use of SNS was associated with more severe weight and appearance dissatisfaction.

	23.08; 70.2% female; *SD*=3.09).			
Ridolfi, Myer, Crowther & Ciesla (2011)	Within subjects design. *N*= 93 females from a large Midwestern university (mean age 19.51, *SD*=3.31).	Personal Data Assistant (PDA) was used to notify participants to complete questionnaires and to complete diary entry (over 5 days). Assessment of Body Image Cognitive Distortions. The Body Shape Questionnaire. The State Self-Esteem Scale (SSES). The Positive and Negative Affect Schedule-Expanded Form (to measure emotions. Following data collection, participants were asked to rate to what degree completing questionnaire about social comparisons made them more aware of these behaviours throughout the day.	To examine the association between young women's naturally occurring appearance focused social comparisons to peers and media images and body image dissatisfaction and body checking.	The process of making appearance focused social comparisons is associated with disturbed body image and affect in a variety of domains. Social comparisons to media images and peers were associated with more frequent body checking and more negative feeling. Generally, however, not found to increase body dissatisfaction. When analysis focused on upward comparison, appearance focused cognitive distortions appearance focused cognitive distortions moderated the relationships between media/peer comparisons and body checking.
Rodgers & Chabrol (2010)	Survey (all questionnaires in French Translation); within subjects design.	Body Shape Questionnaire used to assess body dissatisfaction. The Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ-3) used to assess media influences on appearance.	To explore the moderating effect of self-esteem, anxiety and social phobia on media pressure on media pressure and body dissatisfaction.	Media pressure, anxiety and self-esteem revealed direct effects in the prediction of body dissatisfaction. However, only the interaction between social phobia and media

	N= 200 female students from France (mean age 21.7, *SD*= 2.0).	Rosenberg Self Esteem Scale Hospital Anxiety and Depression Scale. The Social Phobia Inventory to assess social anxiety. BMI calculated and participants asked about ideal weight		pressure was a significant predictor of body dissatisfaction.
Rousseau, Eggermont & Frison (2017)	2 wave panel data with an interval of 6 months. Data was from larger longitudinal panel study on Facebook use and well-being. *Ntime1*=1621 participants, randomly selected from 15 high schools in northern Belgium (mean age 14.76, *SD*=1.41).	Self-report on average Facebook use. Satisfaction with Life Scale to assess life satisfaction. Passive Facebook Use Subscale of the Multidimensional Scale of Facebook Use. Comparison on Face as assessed by question "I often compare myself with other on Facebook when I am reading news feeds or checking others' photos". The Body Dissatisfaction Subscale of the Body Attitude Test.	To examine the relationships between passive Facebook use, social comparison and body dissatisfaction.	Passive Facebook use predicted an increase in boys' comparisons. Comparison was also associated with higher body dissatisfaction. Body dissatisfaction also increased comparison on Facebook, and comparison was also related to more passive use on Facebook, but less passive use over time.

Rutledge, Gillmore & Gillen (2013)	Within subjects design; survey. *N*=255 students from northeastern United States (mean age 19.27, *SD* = 1.35; 54% female).	Facebook Intensity Scale; separate items as opposed to composite scale. Body image: 2 subscales from Multidimensional Body Self Relations Questionnaire: Appearance orientation subscale and Appearance evaluation subscales.	To examine the link between Facebook friends, emotional investment in Facebook and time spent on Facebook with body image.	Individuals more connected to the site more emotionally were more oriented towards their appearance. However also found that individuals who spent less time on Facebook were more concerned with their looks. No connection between time on Facebook and evaluation of appearance.
Sherlock & Wagstaff (2018)	Within subjects. Consisting of 2 parts. P1- correlational design. P2 2X4 mixed method. *N*= 129 women who currently used Instagram (mean age 24.60, *SD* = 4.54).	**P1:** The 20 item Centre for Epidemiologic Studies Depression Scale. The Heatherton Self-Esteem Scale- measures state self-esteem. The State Trait Anxiety Inventory for general anxiety. The Physical Appearance State and Trait Anxiety Scale. **P2:** Instagram stimuli selected from public accounts in relation to beauty, fitness and travel.	To address the link between Instagram use and range of psychological variables including depressive symptoms, self-esteem, general anxiety, physical attractiveness, body dissatisfaction and physical appearance anxiety. Self-rated physical attractiveness was rated by 2 questions: perception of own physical attractiveness compared to same sex peers and perception of own	Instagram correlated with psychological well-being outcomes. Social comparison had a mediating effect on relationship between Instagram use, depressive symptoms, general anxiety, physical appearance anxiety, self-esteem and body image disturbance.

		Measures from P1 were then completed again in randomised order.	physical attractiveness compared to general population. The Body Image Disturbance Questionnaire. Iowa-Netherlands Comparison Orientation Scale. Instagram use measured using questions derived by researchers.	
Stapleton, Luiz & Chatwin (2017)	Non-experimental survey sample; within subjects design. *N*=237 young adults recruited through Facebook (mean age 23.12, *SD*=2.17; 60% female).	11 item Iowa-Netherlands Comparison Orientation Measure. Facebook Intensity Scale adapted for Instagram (by replacing term "Facebook"). Rosenberg Self Esteem Scale. 35 item Contingencies of Self Worth Scale.	To examine the impact of exposure to social media-based social comparison information on self-esteem.	Social comparison on Instagram mediated the relationship between contingent self-worth and self-esteem. Self-worth contingent on approval from other moderated the relationship between intensity of Instagram use and social comparison on Instagram.

Stratton, Donovan, Bramwell & Loxton (2015)	Within subjects design. 3 exercise groups: Cardiovascular trainers Weight trainers Low level exercisers. *N* =307 Australian males (mean age 27.05, *SD*= 6.25).	Media subscale from Perceived Sociocultural Influences on Body Image and Body Change Questionnaire to measure media influence. Male friends subscale of SICCQ used to measure influence of male peers. The Sociocultural Attitudes Towards Appearance Questionnaire (SATAQ) modified for males- more emphasis on muscularity than thinness. Body Comparison Scale. The Somatomorphic Matrix used to provide ratings of muscle dissatisfaction (modified). The Behaviours subscale of the 15 item Drive for Muscularity Scale used to measure behaviours aimed at increasing muscularity.	To examine the Tripartite Influence Model in understanding male body image issues and drive for muscularity. To also examine the influence of media in body image issues and muscularity.	Strong relationship between body comparisons and drive for muscularity behaviours through muscle dissatisfaction. Media influence was positively related to muscular ideal internalisation and indirectly related to muscle dissatisfaction through internalisation.
Stronge, Greaves, Milojev, West-Newman, Barlow & Sibley (2015)	Within subjects- focused on cross sectional data collected in 2012. *N*=11,017 sampled from New Zealand	Body satisfaction assessed by single item developed for longitudinal study. Also asked if they had a Facebook profile, and time spent online.	To examine the link between Facebook usage and body dissatisfaction.	For both men and women, Facebook users reported significantly lower body dissatisfaction than non-users- particularly middle-aged women. Men reported higher body satisfaction than women.

	electoral roll (mean age 49.23, *SD*= 15.12; 62% female).			
Tiggeman & Zaccardo (2015)	Between subjects with 2 levels of the independent variable image type (fitspiration/travel). Dependent variables: mood and body dissatisfaction, state appearance self-esteem and comparison. *N*= 130 female undergraduate students in South Australia (mean age = 19.91, *SD* = 2.80).	Stimulus constructed containing Instagram images (fitspiration and travel sets) sourced from public profiles. Participants asked general questions to establish SNS use. Visual analogue scales to measure mood and body dissatisfaction. State Self Esteem Scales (SESS). Inspirational goals assessed by 3 item construction. State appearance comparison scale. Physical appearance comparison scale.	To investigate the effect of exposure to fitspiration images on women's body image.	Exposure to fitspiration images resulted in greater body dissatisfaction and lower appearance self-esteem than control (travel images).

Tiggemann & Miller (2010)	Within subjects; survey. *N*= 156 adolescent female high school students from South Australia (mean age=14.87, *SD*=1.39).	List of magazines to rate, and frequency of watching TV programmes. Questions were developed to measure internet appearance exposure; participants asked how long on average they spent on the internet each day, what they use the internet for, and to rank in order what they spent most time on. Internalisation of thin ideal was measured by the Sociocultural Internalisation of Appearance Questionnaire-Adolescents. Appearance comparison measured by PACS. Weight satisfaction measured by the Weight Satisfaction Subscale of the Body Esteem Scale for Adolescents. Drive for Thinness subscale of the Eating Disorder Inventory.	To examine the relationship between media exposure and body image in adolescent girls.	Internet appearance exposure was associated with weight dissatisfaction and drive for thinness. Modal time spent on internet was 2-3hours a day. It was indicated 40% Facebook members spent around 45 min per day there
Tiggemann & Slater (2013)	Within subjects design.	Self-report on average time spent on the internet daily. Attitudes Toward Appearance Questionnaire.	To examine the relationship between internet exposure and body image concern in adolescent girls.	Internet exposure was associated with internalisation of thin deal, body surveillance and drive for thinness.

	N=1087 adolescent girls recruited from 18 schools in South Australia (mean age 13.7, *SD*=0.7).	Objectified Body Consciousness Scale-Youth.		
Tiggemann & Slater (2013)	Survey; within subjects design. *N*=189 females in primary school in South Australia (mean age 11.5, *SD*=0.5).	Magazines and television programmes listed; likert scale to measure the frequency of which they read/watched media. Questions were developed to measure internet exposure, which included time spent on the Internet, and websites used including specific questions on MySpace and Facebook usage. Sociocultural Internalisation of Media Ideals Scale to measure internalisation of ideals. Body surveillance Scale of the Objectified Body Consciousness Scale-Youth. Body Esteem Scale for Children. Questions also asked regarding dieting behaviour.	To investigate the relationship between internet exposure and body image concerns in a group of primary school aged girls. **This age is too young for a Facebook account, yet was found that despite this, it was still used.	Internet exposure was associated with internalisation of the thin ideal, body surveillance, dieting and reduced body esteem. Facebook users scored significantly higher on all indicators of body image concern than non-users. Time spent of both Facebook and MySpace were associated with higher levels of internalisation of the thin ideal, body surveillance, dieting and lower body self-esteem.
Tiggemann & Slater (2017)	Longitudinal study; within subjects design.	Self-report on how much time they spent on Facebook and "friends" they had.	To examine the relationship across time between Facebook use and body	Facebook involvement increased substantially over the two-year time period. Body image concerns also increased.

	Participants were a subset of a larger cross-sectional sectional study. Questionnaires completed again 2 years later (Time 2). *N*=438 girls from South South Australia (mean age 13.6 *SD*= 0.7).	Sociocultural Attitudes Towards Appearance Questionnaire. Objectified Body Consciousness Scale-Youth. Drive for Thinness Scale of the Eating Disorder Inventory.	image concern in adolescent girls	Internalisation and body surveillance predicted the number of Facebook friends.
Wang, Wang, Gaskin & Hawk (2017)	Within subjects correlational; survey. N=696 Qzone and WeChat users (mean age=19.43, SD=1.65; 77% female).	Passive SNS use measured by 3 questions surrounding viewing: other's photos, updates and comments. Social Comparison Orientation Scale to measure social comparison. Upward comparison was measured by the Negative Social Comparison Affect Scale.	To examine whether upward social comparison and self-esteem mediate the association between SNS usage and user's subjective well-being, and whether the association between SNS use and upward social comparison is moderated by	Social comparison orientation moderated the association between passive SNS use and user's upward social comparison, and more specifically, social comparison orientation strengthened the association between passive SNS usage and upward social comparison.

		Self-esteem was measured by the Rosenberg Self-Esteem Scale (Chinese version). Subjective well-being measured by summing standardised scores of life satisfaction and positive effect, and then subtracting a standardised score of negative effect. Life satisfaction was assessed by the Satisfaction with Life Scale. Positive and negative effect was measured by the Chinese version of the Positive and Negative Affect Scale.	users' social comparison orientation.	
Won Kim & Chock (2015)	Within subjects design. *N*= 186 young adults from a Northeastern university (64% female; mean age 19.75, *SD*=2.06).	Facebook use for social grooming measured by revised version of SNS for grooming scale-modified for Facebook features. Facebook exposure measured by time spent of Facebook per day. Physical Appearance Comparison Scale. Drive for Thinness 7-tem subscale of Eating Disorder Inventory. Drive for Muscularity Scale.	To examine the relationship between the drives for thinness and muscularity (body image concerns) in young men and women's Facebook use.	Higher levels of social grooming behaviours on Facebook were positively associated with greater drive for thinness and appearance comparison. Grooming behaviours associated with body image concern, but not overall Facebook exposure was not.

2.3.1 Social networking site usage

Time spent on SNS was identified in 17 studies (Tiggemann & Miller, 2010; Kalpidou et al., 2011; Rudtledge et al., 2013; Tiggemann & Slater, 2013; Meier & Gray, 2014; Cohen & Blaszczynski, 2015; Fardouly et al., 2015; Fardouly & Vartanian, 2015; Muench et al., 2015; Jang et al., 2016; Murray et al., 2016; Eckler et al., 2017; Hawi & Samaha, 2017; Marengo et al., 2017; Tiggemann & Slater, 2017; Choukas-Bradley et al., 2018; Hawi & Samaha, 2018). Time spent online was mainly measured through general self-report questions asking to indicate the number of minutes or hours spent on SNS (Tiggemann & Miller, 2010; Tiggemann & Slater, 2013; Cohen & Blaszczynski, 2015; Fardouly & Vartanian, 2015; Muench et al., 2015; Jang et al., 2016; Eckler et al., 2017; Marengo et al., 2017; Tiggemann & Slater, 2017; Choukas-Bradley et al., 2018). Five studies used psychometric tools which included the Facebook Questionnaire (FBQ; Meier & Gray, 2014), the Facebook Intensity Scale (FIS; Kalpidou et al., 2011; Rutledge et al., 2013), the Generalised Problematic Internet Use Scale and the Excessive Time Online subscale (GPIUS; Murray et al., 2016), in addition to the Social Media Addiction Questionnaire (SMAQ; Hawi & Samaha, 2017). Average time spent on SNS was between 1.5-2 hours per day (Tiggemann & Slater, 2013; Cohen & Blaszczynski, 2015; Fardouly & Vartanian, 2015; Muench et al., 2015; Eckler et al., 2017, Marengo et al., 2017; Choukas-Bradley et al., 2018), with one study reporting a time of 45 minutes spent on Facebook (Tiggemann & Miller, 2010). Additionally, it was noted that one study also included participants who reported their daily time spent on social media as exceeding 11 hours (Choukas-Bradley et al., 2018). It was indicated that on Facebook, reading newsfeed was the most popular activity, followed by viewing photos and messaging on a typical visit to the site (Eckler et al., 2017).

Findings indicated an increase in the frequency of SNS use within the last decade. Results by Tiggemann and Miller (2010), in a study that consisted of 156 adolescent female high school

students, indicated that the modal time spent on the internet generally was 2-3 hours per day, with 40% of this sample spending 45 minutes per day on Facebook. More recent studies however have demonstrated an increase in the amount of time spent on SNS. Results by Muench et al. (2015) found that 94% of respondents reported being on Facebook at least once a day, with 80.8% being on Facebook for more than 15 minutes per day, and 20% spending more than two hours a day on Facebook. This was further supported by Fardouly and Vartanian (2015) who also demonstrated a modal time of two hours spent on Facebook using a young Australian female sample.

Two studies directly measured excessive and addictive SNS use. A study by Choukas-Bradley et al. (2018) used the Excessive Time Online subscale of the Generalized Problematic Internet Use Scale, with higher scores indicating more problematic social networking. It was found that females reported significantly more perceived time on SNS as opposed to males. Similarly, Hawi and Samaha (2017) used the Social Media Addiction Questionnaire on a sample of 396 university students in Lebanon. Scores indicated a moderate level of addictive social media use overall, with females reporting higher levels of social media use (mean score 26.2) than males (mean score 22.8). Furthermore, whilst many of the presented studies indicate an average of two hours a day, Marengo et al. (2018) implemented a two-hour cut-off in the identification of high social media use. Findings demonstrated 29.1% of respondents used highly visual social media (HVSM), such as Instagram and Snapchat, for more than 2 hours a day, which resulted in higher levels of emotional symptoms among HVSM users (Marengo et al., 2018). Following this, it was highlighted within the study by Choukas-Bradley et al. (2018) that four respondents reported a daily time spent on social media to exceed eleven hours, pointing towards excessive and addictive SNS tendencies.

It has also been suggested that gender may predict excessive SNS use. This was indicated in one study using the GPIUS which found that females reported they spent significantly higher excessive time on SNS a week (mean score 13.79) than males (mean score 11.71), which was also associated with increased weight and appearance dissatisfaction (Murray, Maras & Goldfield, 2016). In a more recent study that compared both social media and internet addiction, it was demonstrated that gender predicted social media addiction, but not internet addiction (Hawi & Samaha, 2018). It was speculated by the authors that this may be because male respondents had internet gaming in mind whilst completing the IAT, whilst female respondents were thinking about social media use, and therefore the effects of the two genders may have cancelled each other out in the results for internet addiction and social media addiction (Hawi & Samaha, 2018).

The present studies demonstrate that frequency of SNS use has increased in recent years, with an average of two hours a day being spent online. However, the majority of the studies implemented self-report measures in terms of respondents' perceived time online, which may be subject to social desirability and recall bias. In addition to this, whilst no specific time was indicated as a baseline for the indication of addictive use, it has been suggested that more than two hours a day may point towards excessive SNS usage (Marengo et al., 2018). However, the motives for SNS use and usage patterns are not the same across all types of SNS and cannot be applied across all SNS platforms and contexts (Jang, Park & Song, 2016). Consequently, further research is needed in terms of generalizability of findings and objective investigation.

2.3.2 Body image and concerns

The relationship between SNS and body image concerns was measured with a variety of psychometric tools. Five studies included the Physical Appearance Comparison Scale (PACS; Meier & Gray, 2014; Fardouly & Vartanian, 2015; Tiggemann & Zaccardo, 2015; Hendrickse et al., 2017; Cohen et al., 2017) for the measurement of body dissatisfaction in female adolescents and young adults aged 15-21 years (Meier & Gray, 2014; Hendricke et al., 2017), with sample sizes ranging from 103-259 (Meier & Gray, 2014; Cohen et al., 2017). The Body Shape Questionnaire was also implemented in a number of studies to assess body dissatisfaction (BSQ; Rodgers & Chabrol, 2010; Ridolfi et al., 2011; Marengo et al., 2017). It was noted that one study also included a Personal Data Assistant (PDA) to notify participants to complete the psychometric tests used in the study over a period of five days (Ridolfi et al., 2011). Furthermore, a total of five studies used an experimental design, with the majority of these studies focussing on Instagram images as the variable stimuli (Cohen & Blazczynski, 2015; Fardouly et al., 2015; Tiggemann & Zaccardo, 2015; Sherlock & Wagstaff, 2018; Tiggemann & Barbato, 2018) to investigate exposure to SNS images and body dissatisfaction.

Much of the research suggested that frequent use of SNS is associated with increased body image concern and dissatisfaction, with many studies in particular surrounding Facebook. One study by Tiggemann and Slater (2013) investigated this relationship with a sample of 189 girls aged 10-12 years. Whilst this sample was too young to own their own Facebook profile (under 13 years), findings indicated that internet exposure was associated with body surveillance and reduced body esteem, whilst Facebook users scored significantly higher on all indicators of body image concern. Research with an older sample of young females (mean age 19.13) also produced similar findings by showing a positive association between the

frequency of Facebook usage and body image concerns, which were mediated by appearance comparisons in general (Fardouly & Vartanian, 2015).

Arguably, much of the research regarding SNS and body image concerns surrounds the drive for thinness and weight. Indeed, the findings of a survey using 383 undergraduate students found that greater SNS use was associated with both weight and appearance dissatisfaction (Murray et al., 2016). More specifically, it was found that lower weight and appearance esteem mediated the relationship between excessive time on SNS, in addition to restrained eating in males and females (Murray et al., 2016). In addition to this, a study by Cohen, Newton-John and Slater (2017) found that photo-based activities on Facebook were associated with greater thin ideal internalisation and body surveillance, whilst Instagram use was associated with greater thin ideal internalisation, body surveillance and drive for thinness. Likewise, Hendrickse et al. (2017) examined the association between appearance-related comparisons made on Instagram and body image. Results reported that individuals experienced a more intense drive towards thinness and had greater body dissatisfaction, particularly if they found themselves frequently engaging in comparisons with others. These findings suggest that women who engage in appearance-related comparisons may be particularly susceptible to body image concerns; however, comparisons did not completely explain the relationship between Instagram and body image concerns (Hendrickse et al., 2017), suggesting that further research should consider other potential mechanisms that may contribute to these outcomes.

Body image concerns also surrounded drive for muscularity and muscle dissatisfaction, particularly in studies comprising male samples. A study by Stratton et al. (2015) comprised of 307 males who described their exercise patterns as either being regular cardiovascular trainers, low level exercisers or weight trainers. Findings presented a strong relationship between body comparisons and drive for muscularity, whilst there was also a positive

influence between media and muscle dissatisfaction, and muscular ideals. A study by Daniel and Bridges (2010) also found that internalisation of media ideals, in addition to body mass index (BMI), were the strongest predictors for the drive for muscularity. However, although it appeared that body type ideals for men do impact body image, it is not wholly clear how this relationship is established and how this consequently leads to increased drive for muscularity (Daniel & Bridges, 2010), indicating the need for further research into this relationship.

Furthermore, one study examined the relationship between men and women's drive for muscularity and thinness, and found that passive use of Facebook was associated with a higher drive for thinness in both sexes, however Facebook use was not associated with drive for muscularity for either males or females (Kim & Chock, 2015). It was speculated that the type and nature of the images shared by peers on social media may have influenced concerns about thinness as opposed to muscularity, thus indicating that future research needs to investigate the differences between the two types of body image concerns and their relationship to passive SNS use (Kim & Chock, 2015).

Arguably however, a study by Fardouly et al. (2015) using a two-part study with a between subjects experimental design, found that exposure to Facebook did not have a direct effect on young women's satisfaction with their body, or on their desire to change their weight or shape. Instead, findings highlighted that for women who were high in appearance comparisons, Facebook usage was related to a greater desire to change their face, hair and skin-related features (Fardouly et al., 2015). The differential findings of this study may be explained by women being more likely to upload more portrait pictures, as opposed to full body pictures, which could provide more opportunities to make facial, skin and hair-related comparisons than body comparisons (Haferkamp et al., 2012).

Overall, whilst the findings of the current studies highlight the relationship between SNS use and body image concerns, it is noted that there is a lack of longitudinal designs presented within the research. Indeed, due to the correlational nature of much of the presented research, it has been suggested that there likely exists a bidirectional relationship between SNS engagement and body image outcomes (Cohen et al., 2017), and because of this, no causal inferences can be drawn as to whether SNS use is the causal factor for body image dissatisfaction and concerns. Further experimental research is therefore needed to measure pre-existing trait body image concerns to examine if such pre-existing traits modify the effect of SNS usage on body image dissatisfaction (Fardouly & Vartanan, 2015).

2.3.3 SNS features

Various features of SNS have been highlighted to mediate the relationship between body image concerns and SNS use in total of ten studies (Rutledge et al., 2013; Tiggemann & Slater, 2013; Meier & Gray, 2014; Tiggemann & Zaccardo, 2015; Stronge et al., 2015; Eckler et al., 2017; Rousseau et al., 2017; Cohen et al., 2017; Marengo et al., 2017; Brichacek et al., 2018). Features of SNS use were predominantly assessed using a number of self-report methods, including the Instagram Photo Activity Index (Meier & Gray, 2014), the Passive Facebook Use Subscale of the Multidimensional Scale of Facebook Use (Rousseau, 2017), the Facebook Questionnaire (Cohen et al., 2017) and items from the Facebook Intensity Scale (Rutledge et al., 2013). In one study, the impact of SNS features was also measured through experimental manipulation of image types (Tiggemann & Zacardo, 2015). The studies identified consisted of sample sizes ranging from 103-11,017 (Meier & Gray, 2014; Stronge et al., 2015), with longitudinal studies including larger samples of participants. Ages ranged between 11.5-23.83 years (Tiggemann & Slater, 2013; Eckler et al., 2017) and participants were predominantly female across all studies.

Whilst many studies highlight that SNS usage frequency and exposure is linked with body image concerns (Tiggemann & Slater, 2013; Stronge et al., 2015; Eckler et al., 2017), it was indicated that the way individuals engage on SNS has been shown to also play an important role in the mediation of body image concerns and well-being (Rousseau et al., 2017), demonstrating that passive Facebook use predicted an increase in male appearance comparisons and increased body dissatisfaction. However, in contrast to previous research, findings also indicated that passive Facebook use did not predict female comparisons and consequent body dissatisfaction (Rousseau et al., 2017). To explain these results, it was suggested that females may implement avoidant coping strategies, such as minimising social comparisons, to cope with increased actual-ideal body image discrepancies that may occur through appearance comparisons.

Furthermore, a study by Meier and Gray (2014) also argued it is not the total time spent on Facebook, but rather the amount of Facebook time that is allocated on photo-based activity that facilitates body image disturbance, through internalisation of ideals. Findings by Cohen et al. (2017) also supported this, by demonstrating that it was appearance-focussed SNS use, rather than overall SNS use that was related to body image concerns in young women. Additionally, the results also indicated that greater engagement in photo activities on Facebook, as opposed to general Facebook use was associated with greater thin ideal internalisation and body surveillance (Cohen et al., 2017).

The emphasis of appearance-focussed SNS use was further highlighted in the results of a survey comprising of 598 adolescents. It was demonstrated that participants who reported using Highly Visual Social Media (HVSM) such as Instagram or Snapchat more frequently also reported having significantly higher body image concerns than individuals who reported no use of HVSM (Marengo et al., 2017). Similarly, Tiggemann and Zaccardo (2015) more specifically looked at exposure to fitspiration images in comparison to control (travel) images

on Instagram and found that exposure to fitspiration images resulted in greater body dissatisfaction and lower appearance self-esteem than the control images, an effect that was mediated by appearance comparison processing. This was further supported by Brichacek et al. (2018) in an experimental study with Facebook, which demonstrated that viewing Facebook images that depicted body image ideal resulted in lower body image satisfaction.

In contrast however, findings by Rutledge et al. (2013), did not support the relationship between time spent on Facebook and body image concerns, although it was indicated that individuals who were more emotionally connected to Facebook tended to be more oriented towards their appearance. It was speculated that this may be because users tend to know their friends on Facebook; therefore, viewing their own and friends images may not affect their own evaluation as they are able to distinguish between their online selves and real selves (Rutledge et al., 2013).

Whilst a number of studies examine general SNS usage (Tiggemann & Slater 2013; Stronge et al., 2015), the current studies indicate that photo-based SNS activity and passive SNS use are strongly associated with body image concerns through the mediation of appearance comparisons. Indeed, it has been suggested that individuals may use SNS content as a source of information on how to improve their physical appearance, and it may be that self-improvement desires motivate individuals to seek comparison targets on SNS to evaluate and compare their appearance to (Rousseau et al., 2017). Active SNS use on the other hand has been indicated to have a positive effect on psychological well-being, through the ability for individuals to communicate and engage with each other (for example through commenting or liking posts) (Ghosh & Dasgupta, 2015). Consequently, it may be that such findings indicate towards a cycle of SNS use and body dissatisfaction, in which passive SNS use positively influences comparison and body dissatisfaction, and that these behaviours and cognitions positively influence passive SNS use (Rousseau et al., 2017).

2.3.4 Mediating factors

A total of 12 studies were highlighted to identify mediating factors (Ridolfi et al., 2011; Tiggemann & Slater, 2013; Fardouly & Varanian, 2015; Hanna et al., 2017; Hendrickse et al., 2017; Rousseau et al., 2017; Stapleton et al., 2017; Wang et al., 2017; Choukas et al., 2018; Fardouly et al., 2018; Feltman & Szymanski, 2018; Sherlock & Wagstaff, 2018). These studies comprised of predominantly female participants and included samples from primary school (Tiggemann & Slater, 2013), university (Fardouly & Vartanian, 2015; Chouckas et al., 2018), in addition to Ozone and WeChat users (Wang et al., 2017) and Instagram users (Sherlock & Wagstaff, 2018). Mediating factors included internalisation of the thin ideal, appearance comparisons and self-esteem, measured using a variety of psychometric tests, including the Sociocultural Internalisation of Media Ideals Scale (Tiggemann & Slater, 2013), the Iowa Netherlands Comparison Orientation Measure (Hanna et al., 2017; Stapleton et al., 2017), items from the Physical Appearance Comparison Scale (Hendrickse et al., 2017), the Appearance Comparison Scale (modified for comparison on Facebook) (Fardouly & Vartanian, 2015), the Heatherton Self-Esteem Scale (Sherlock & Wagstaff, 2018) and the Rosenberg Self Esteem Scale (Stapleton et al., 2017).

In regard to shape and weight concerns in particular, the internalisation of thin ideals was highlighted as a strong mediating factor in the drive for negative body image, thinness and weight dissatisfaction in a number of studies. A recent study found that engaging in appearance-related comparisons on Instagram was associated with a more intense drive towards thinness and body dissatisfaction (Hendrickse et al., 2017). However, it was highlighted that photo related activities on Instagram were not directly associated with body image dissatisfaction, but that they were related through both internalisation and appearance comparisons (Hendricke et al., 2017; Fardouly et al., 2018). It was posited that this may be due to salience of societal beauty ideals available through the platform (Fardouly et al., 2018)

and was further supported by Feltman and Szymanski (2018), who found that the internalisation of cultural standards of beauty, in addition to engaging in appearance comparisons, mediated the link between Instagram usage, body surveillance and self-objectification.

Similarly, Tiggemann and Slater (2013) conducted a study using a survey with 1087 adolescent females to examine the relationship between internet exposure and body image concerns. Findings indicated that internet exposure was associated with internalisation of the thin ideal, drive for thinness and body surveillance. Facebook users in particular were highlighted as scoring significantly higher on all indicators of body image concern, and it was suggested that this may have been facilitated through the speed and ease in which individuals can connect with their peers online, providing the opportunity for multiple social comparisons, and consequential body image dissatisfaction (Tiggemann & Slater, 2013).

Appearance and social comparisons were also highlighted in a number of studies as a strong mediator in body image dissatisfaction. One study investigating the relationship between Facebook usage and body image concerns among female university students tested whether it was appearance comparisons in general or comparisons to specific target groups that mediated this relationship. Findings indicated that frequency of Facebook usage was positively associated with body image concerns, which were mediated by appearance comparisons in general (Fardouly & Varanian, 2015). Similarly, a recent study by Choukas et al. (2018) investigated a construct related to women's experiences with SNS, appearance related social media consciousness (ASMC); the extent to which an individual's thoughts and behaviours reflect an on-going awareness of their attractiveness to a social media audience. It was found that higher levels of ASMC were positively associated with increased body comparison, in addition to higher body surveillance and lower self-esteem (Choukas et al., 2018). One longitudinal study also indicated that passive Facebook use has been shown to

predict an increase in young boys' appearance social comparisons, which was subsequently associated with higher body dissatisfaction (Rousseau et al., 2017), whilst a recent study by Hanna et al. (2017) demonstrated that social comparison and self-objectification mediate the relationship between body shame, Facebook use, self-esteem and mental health.

It has been emphasised that the direction of comparison plays a role in mediation. Ridolfi et al. (2011) showed that whilst social comparisons to media images and peers were associated with more frequent body checking in regard to weight and shape, the focus on upward comparisons was associated with greater body dissatisfaction and body checking, and comparisons to social media images and peers in general were not associated with an increase in body dissatisfaction. In addition to this, the findings of a recent survey demonstrated that passive SNS usage was also related to upward social comparison, which was consequently associated with users' lower self-evaluation (Wang et al., 2017). Furthermore, the results also demonstrated that upward social comparisons mediate the relationship between passive SNS usage and subjective well-being, further indicating that upwards social comparison is an important variable associated with negative psychological outcomes for individuals after using SNS (Wang et al., 2017).

In addition to internalisation of ideals and appearance comparisons, self-esteem was also found as a mediator in body image dissatisfaction and was often a co-mediator with comparison. A recent study by Sherlock and Wagstaff (2018) was conducted in two parts, consisting of both a correlational design and a mixed design. It demonstrated that heavier Instagram use was positively correlated with a range of psychological outcomes including lower self-esteem, body image disturbance and physical appearance anxiety, which was mediated by social comparison. These findings were also parallel with results of Hanna et al. (2017), who demonstrated that Facebook use was associated with both increased social comparison and self-objectification, which was subsequently associated with lower self-

esteem, in addition to greater body shame and poorer mental health. In relation to this, it has been indicated that social comparison on Instagram also mediated the relationship between self-worth, dependent on the approval of others (Stapleton et al., 2017). Although initial findings did not observe a direct association between Instagram use and self-esteem, the domain of self-worth in this study suggests that the intensity of Instagram use is influential, particularly when an individual's self-worth is contingent on approval from others online (Stapleton et al., 2017). These findings highlight social comparison as a mediator across various dimensions of well-being, including self-esteem and body image dissatisfaction, indicating comparison on SNS as a strong factor in body image concerns.

The findings of the current studies demonstrate a number of mediating factors in the relationship between SNS use and body image concern. Whilst self-esteem and internalisation of ideals contribute to body dissatisfaction, comparisons with others whilst using SNS is a predominant factor in the development and maintenance of body image concerns, particularly if such comparisons are upward in direction (Ridolfi et al., 2011). Additionally, it is suggested that high social comparison orientation SNS users are more likely to engage in upward social comparisons, and therefore face more detrimental effects in regard to self-evaluations and well-being (Wang et al., 2017). Such findings support the need for further exploration in potential body image and media literacy interventions to educate individuals about the impact of comparisons on SNS and well-being (Fardouly et al., 2015).

2.4 Discussion

The present systematic literature review aimed to provide an overview of the research available focussing on the influence of SNS usage on body image dissatisfaction. A total of 40 empirical studies were identified, with a focus on SNS usage frequency, SNS features and mediating variables that may contribute to the facilitation of body image concerns. Factors including SNS features and appearance comparison online were found to contribute to body image dissatisfaction. Parallels between body image dissatisfaction and BDD symptoms are also discussed, in addition to implications for future research.

Although problematic SNS use is not acknowledged as a diagnosis, there has been substantial research on excessive SNS use. From the studies presented, the lack of consensus in establishing the baseline between normal SNS use, excessive use and addictive use is highlighted. A majority of the studies use the number of hours spent on SNS or frequency of checking SNS as being indicative of excessive SNS use (e.g., Cohen & Blaszczynski, 2015; Fardouy & Vartanian, 2015; Choukas-Bradley et al., 2018). It has been suggested (in regard to Facebook usage) that using a broader concept of time allows for all activities and length of exposure on Facebook to be taken into account, in addition to their potential joint influence on body image (Eckeler et al., 2017). However, usage patterns are not the same across all SNS platforms (Jang et al., 2016), thus assessing total exposure time may not be comprehensive enough in understanding body image behaviour on SNS (Kim & Chock, 2015). This may be further implicated in that many studies focus only on Facebook, which arguably confines findings of SNS usage and subjective well-being outcomes to this particular site. Other studies included dimensional scales, such as the SMAQ (Hawi & Samaha, 2017) that assess use, SNS addiction and activities in all forms of social media, which are beneficial in that they provide a multidimensional perspective to understanding SNS use (Casale et al., 2015). However, self-report measures that assess engagement with

SNS tend to use high scores to correlate SNS use with negative outcomes (e.g., Boumolesh & Jalouk, 2017; Choukas-Bradley et al., 2018), in addition to relying on conscious and retrospective reports on usage, which cannot assess for specific behavioural activity on certain SNS platforms, such as type of engagement with images (Ellis et al., 2018), making it difficult to pinpoint the extent to which specific appearance-based SNS use impacts body image satisfaction. Subsequently, if SNS research aims to extend into clinical assessment, a standardised baseline regarding SNS usage time needs to be implemented to allow for comprehensive comparison across findings, in addition to distinguishing between excessive and problematic SNS use. Indeed, it should be noted that one study within the present review determined a two-hour cut-off for time on SNS as an indication for excessive use (Marengo et al., 2017), whilst another indicated moderate SNS use as between 30-60 minutes a day (Hanna et al., 2017). Studies that suggest spending two hours online may therefore be considered a recommended cut-off time in establishing frequent SNS use. In addition to this, methods that utilise objective assessment, whereby data are collected directly through the smartphone, can allow for the monitoring of user behaviour on SNS sites in real time and provide further insight into specific appearance-based usage and user engagement on SNS platforms (Miller, 2012; Tossell et al., 2015). Nevertheless, the importance of clinical utility in the use of assessment scales is highlighted, and should be established in terms of presentation within clinical assessment.

In terms of gender, females endorsed a significantly higher time on SNS in comparison to males, which was also associated with appearance dissatisfaction. Findings suggest that females are more likely to spend an increased amount of time on SNS, resulting in higher weight and appearance concerns (Murray et al., 2016), and it may be argued that this is attributed to the motivations of SNS use. That is, findings demonstrate that women are more likely to use SNS to search for information and compare themselves to others as opposed to

males (Haferkamp et al., 2012). This may be reflected in the higher levels of SNS use, suggesting that women actively go online more frequently to seek and obtain certain gratification in regard to appearance comparison (Scott et al., 2017). This was further supported by Marengo et al. (2018), who found that females are more likely to use highly visual SNS as opposed to males, which consequently leads to greater body image dissatisfaction; such effects were stronger when SNS usage was above two hours a day. Arguably, it was highlighted in this review that 20 studies were conducted with young female samples, with a lack of male inclusion, which may not accurately reflect SNS usage and gender differences wholly; indeed, findings were shown to be contradictory in studies that did include male samples (Haferkamp et al., 2012; Rousseau et al., 2017). Whilst more recent research is beginning to include male-focussed samples (Stratton et al., 2015; Abbas & Karadavut, 2017), further research is needed to capture SNS usage and well-being outcomes in males.

Whilst the studies in the present review supported the relationship between SNS use and body image concerns, differential body image concerns were also highlighted. In parallel to previous research on traditional forms of media, much research focussed on body image concerns considering the drive for thinness and weight. Indeed, internalising ideals was a strong mediating factor in the drive for both weight and muscle dissatisfaction in a number of studies (e.g., Daniel & Bridges, 2010; Tiggemann & Slater, 2013; Cohen et al., 2017), and it could be suggested that individuals reinforce their self-concept and self-perceptions of attractiveness through selectively attending media content, which subsequently produces a drive for self-improvement (Rousseau et al., 2017). In comparison, one study found that Facebook use had no direct effect on body satisfaction, or the desire to change weight or shape (Fardouly et al., 2015). Rather, for women high in appearance comparisons, Facebook usage was associated with greater desire to change face, hair and skin related features

(Fardouly et al., 2015). It has been indicated that women are more likely to upload portrait pictures onto SNS, as opposed to full body pictures, which may provide increased opportunities for facial, skin and hair related comparisons (Haferkamp et al., 2012), which may have contributed to the differential findings of this study. It was noted that many of the measures used to assess body image concerns within this review included the PACS and BSQ, which focus on weight and body shape comparisons. This may have subsequently biased findings towards weight-related body dissatisfaction. Indeed, the popularity of selfies (self-portrait pictures) has dramatically increased (Chae, 2017); research has shown that individuals are more likely to have an idealised virtual self-image when editing their own selfies (Halpern et al., 2017), whilst those exposed to others' edited selfies are more likely to experience an increased desire to change facial appearance, through reduced self-esteem (Borges, 2011). Such findings suggest that increased pressure about appearance concerns may therefore be contextually changing towards facial dissatisfaction, and indicates that measures focussing on facial dissatisfaction, such as the FACE-Q, which assesses overall satisfaction with facial appearance (Pusic et al., 2013), may be advantageous to use in future research, either solely or in conjunction with body shape measures. Nevertheless, it is important to consider the impact of SNS in terms of broader appearance constructs, beyond a focus of weight and shape body dissatisfaction.

Furthermore, it was demonstrated that various features of SNS mediated the relationship between body image dissatisfaction and SNS use. In particular, appearance-focussed SNS use and passive SNS use were associated with the facilitation of body image dissatisfaction (Meier & Gray, 2014; Tiggemann & Zaccardo, 2015), emphasised through the mediation of appearance comparisons. Indeed, longitudinal research has indicated that passive Facebook use predicts an increase in individuals' appearance comparisons, which was consequently associated with higher body dissatisfaction (Rousseau et al., 2017). It could be suggested that

individuals' use of SNS as a source of information to improve physical appearance may consequently motivate users to seek comparison targets to evaluate and compare their appearance to (Rousseau et al., 2017). This may therefore lead to increased passive SNS use, photo-based SNS activity and higher body image dissatisfaction. However, in regard to appearance-focussed SNS activity, other studies highlighted it correlated with some body image measures (e.g., thin ideal internalisation), but not others (e.g., appearance evaluation) (Meier & Gray 2014; Cohen et al., 2017), indicating that not all SNS features relate to body image concerns in the same way. Arguably, it was noted that these studies focussed on Facebook, which also includes an array of activities surrounding news, games and events, in addition to photo-based features (Horzum & Demirhan, 2017), and so it may be that the context of appearance-focussed use was implicated by other features specific to Facebook. Platforms such as Instagram, which focus on a highly image-based environment, may have a stronger association with body image dissatisfaction. This indicates that measures chosen to assess such constructs may not be adequately sensitive to different SNS environments and suggests that the development of body image measures specific to differential SNS environments would be beneficial for future research.

The role of comparison was highlighted as a predominant mediating factor in the relationship between SNS and body image dissatisfaction. Upward comparisons in particular were demonstrated to be most detrimental, leading to stronger appearance-focussed cognitive distortions (Ridolfi et al., 2011). This remains consistent with prior research that demonstrated negative comparison as leading to maladaptive cognitions (Nolen et al., 2008). Indeed, SNS tend to exhibit idealised photos and information, usually altered and exaggerated by users who upload them (Tiggemann & Ziccardo, 2015), and it is therefore likely that individuals who are exposed to such information may feel more personally inadequate in their appearance. Findings reflected this; it was demonstrated that comparisons mediated

levels of self-esteem, with increased comparison being associated with lower self-esteem, subsequently leading to greater body shame (Hanna et al., 2017). However, due to the cross-sectional nature of many studies, causal inferences cannot be drawn in terms of comparison processes. For example, it has also been suggested that individuals who already experience distorted appearance-focused cognitions may place higher value on aesthetic appearance and therefore are more likely to evaluate themselves physically through comparison targets online (Ridolfi et al., 2011). Causality should therefore be supported directly through experimental studies, or further informed by longitudinal design. Nevertheless, it is highlighted that appearance comparisons are a strong mediator across dimensions of well-being, including body image dissatisfaction and self-esteem.

Following this, although BDD was not explicitly compared with body image dissatisfaction and SNS use within any of the presented studies, parallels between BDD and body image behaviours and concerns are highlighted. The role of comparison is perhaps the most predominant feature shared between individuals with body image dissatisfaction and BDD. Indeed, symptoms of BDD include the performance of repetitive behaviours, such as reassurance-seeking and comparison (Kelly et al., 2013), strong mediators in body image dissatisfaction and SNS use. More specifically, prior research has shown that BDD individuals report increased levels of comparison when comparison targets are high in both overall attractiveness and in the attractiveness of specific features the BDD individual was concerned about (Anson et al., 2015). It has been proposed that such upward comparison may contribute to the maintenance of BDD symptoms through (i) amplifying appearance-related focus and preoccupation, (ii) reinforcing selective focus on their specific body part, subsequently heightening awareness in the perceived defect, and (iii) contributing to the biased view of the appearance of others as a whole (Anson et al., 2015). This is consistent with the studies in the present review, which indicate that higher frequency of upward

comparisons is associated with increased negative evaluation and body image dissatisfaction, and suggests that high frequency of appearance comparisons on SNS may facilitate the development and maintenance of BDD symptoms.

Furthermore, as many of the present studies suggest, body image dissatisfaction associated with SNS was largely related to weight and shape concerns. Prior research has suggested that individuals with BDD weight concerns tend to exhibit a wider range of body preoccupations and higher level of symptom severity, which are not necessarily attributed to the presence of weight concerns (Kittler et al., 2007). That is, people with BDD tend to focus on specific body parts, with the skin, hair and nose being the most reported body areas of concern (Phillips et al., 2005), and it could be suggested that this was reflected in the differential results of Fardouly et al. (2015). Further supporting this, a recent case report by Khanna and Sharma (2017) highlighted that excessive selfie use was used as a safety behaviour to manage the distress related to BDD, with appearance concerns of the client focussing on the nose, complexion and hair, with further assessment of the client revealing the presence of problematic internet use, in addition to excessive levels of mobile and Facebook use (Khanna & Sharma, 2017). This indicates that SNS may play a role in the maintenance of BDD and further emphasises the need for increased awareness of SNS use within clinical assessment. However, concerns related to body shape and weight can characterise patients with BDD, in addition to those with Muscle Dysmorphia (MD), a subtype of BDD that is characterised by not being satisfactorily muscular or lean (Klimek et al., 2018). Gender differences may be attributed to differential body image concerns, which have been highlighted in the focus of aesthetic fixation between males and females in terms of BDD; women are more likely to focus on the face, weight, stomach and breasts, whereas men are more likely to focus on body build, hair and genitals (Phillips et al., 2006). Indeed, such concerns are found to be consistent with the findings in the present review, and were particularly emphasised in studies

surrounding male samples, in which muscle dissatisfaction and drive for muscularity was highlighted (Daniel & Bridges, 2010; Stratton et al., 2015). This suggests that SNS comparisons and self-evaluation is not necessarily limited to facial and head preoccupations in terms of the development of BDD symptoms, and demonstrates an implication that should be considered in terms of future BDD research in the context of body ideals presented on SNS.

Similarities in prevalence were also highlighted in terms of SNS usage and BDD. Young adults have been indicated to be the most active users on SNS, with findings from the present study showing that females spend more time online (Murray et al., 2016; Smith & Anderson, 2018). Consistent with this, recent research has demonstrated that the prevalence of subthreshold BDD is significantly higher in older adolescents, in addition to being more predominant in females (Schneider et al., 2017), indicating frequent SNS use as a potential risk factor in the development of BDD in consideration of prevalence levels. It is noted however, that whilst subthreshold disorders do not meet full diagnostic criteria, they do involve the presence of core symptoms and impairment, which has been shown to predict clinical manifestations of the disorder (Wolitzky-Taylor et al., 2014). Therefore, it could be suggested that individuals who seek to use SNS to compare themselves to others (Scott et al., 2017), may present subthreshold BDD symptoms, making them vulnerable to the onset of the clinical manifestation of the disorder. Since subthreshold BDD does not represent an ordinary level of appearance concern (Schneider et al., 2017), future research should consider the identification of subthreshold BDD presentations in SNS use and body image research.

2.4.1 Limitations

The current systematic review is not without limitations. The terms social media and SNS are often used interchangeably, but they are not the same (Kuss & Griffiths, 2017). Social media encompasses a wide range of social applications which refer to the producing, sharing and collaborating online; therefore engaging in SNS regards a specific type of social media use (Kuss & Griffiths, 2017). Subsequently, the review included studies that did not specifically discern the definition of social media, in addition to including a range of different SNS platforms (e.g., Facebook, Instagram) as opposed to focussing on one specific platform, which may have implicated the conclusions drawn. Moreover, research in the area of SNS and body image is constantly growing, and it is likely that studies that are in the process of submission or that have been published since have not been included within the review.

2.5 Conclusion and implications

Overall, the type of engagement on SNS, in particular passive use and appearance-focussed SNS use, was found to be significantly associated with greater body image dissatisfaction. If SNS research aims to extend into clinical assessment, a standardised baseline needs to be established in terms of SNS frequency, to distinguish between normal, excessive and addictive SNS use, to allow for comprehensive comparison within findings. Additionally, in terms of SNS features, further attention needs to be paid towards platforms other than Facebook. Although Facebook contains an array of various activities, measures that have been chosen to assess appearance-based constructs may not be sufficiently sensitive to different online environments. It is suggested that the development of body image measures that are specific to differential SNS environments would be beneficial for future research, and would allow for more comprehensive insight into the specific features of SNS that contribute to body image disturbance. Furthermore, it is highlighted that parallels appear apparent between body image dissatisfaction and BDD symptomatology, particularly in terms of

comparisons and prevalence of SNS usage. It is suggested that frequent SNS comparisons may mediate the onset of subthreshold BDD, leading to increased SNS usage and maintenance of BDD symptoms. Considering the detrimental impact clinical BDD can have, future research needs to extend to assess SNS as a risk factor in the development of BDD symptomatology. In light of this, the empirical studies presented in this thesis will take a focus on Instagram, due to its highly visual environment. Chapters 5, 6 and 7 will explore the role of Instagram on body image and well-being in a non-clinical population, whilst Chapters 8 and 9 will explore the role of Instagram and SNS in the clinical context of BDD.

CHAPTER 3

Passive objective measures in the assessment of problematic smartphone use: A systematic review

The present chapter presents the second systematic review conducted for the present project. This review focussed on elucidating how observations of specific patterns of smartphone usage may be employed to understand user behaviour. This study was critical to develop an understanding into how SNS usage patterns can be inferred. It was also essential to identify which features of SNS could be beneficial in assessing problematic SNS usage, as problematic SNS patterns may be linked to well-being outcomes. This chapter developed upon the previous systematic review by highlighting nuanced features and patterns of SNS that may be problematic in users, whilst also informing the methods within the present project.

3.1 Introduction

Technological advances within the last decade have led to a significant increase in mobile technologies. The use of smartphones in particular has grown exponentially owing to the portability and connectivity that they allow, enabling access to information and entertainment content almost anywhere without the constraints of physical proximity or spatial immobility (Geser, 2004; Billieux, 2012; Jeong et al., 2016). However, despite the positive affordances that smartphones can enable, prevalence studies have estimated rates of problematic smartphone use to range between 0% to more than 35% (Yen et al., 2009; Lopez-Fernandez et al., 2013). Research has indicated that the excessive use of smartphones can lead to negative outcomes in terms of psychopathology (Elhai et al., 2017), academic settings (Hawi & Samaha, 2016), poor sleep quality (Dermirci et al., 2015; Chung et al., 2018) and physical health (Kim et al., 2015), subsequently leading to increasing concern surrounding the addiction of smartphones. Yet, despite the increase of research regarding smartphone

addiction, it is not classified within the DSM-5 or draft of the ICD-11 (Panova & Carbonell, 2018).

As a result, there is no definitive definition or conceptualisation of smartphone addiction, and with notably few papers aiming to clarify nosological questions regarding smartphone addiction, there is an increasing tendency to utilise non-pathological terminology (Bae, 2017). Studies that support the existence of smartphone addictions tend to do so on the belief that smartphone addiction and smartphone usage time are tightly coupled (Shin & Lee, 2017), or if they fit within the component model of addictive behaviours as posited by Griffiths (2005), including the criteria salience, mood modification, tolerance, withdrawal symptoms, conflict and relapse. Subsequently, terms including 'excessive' or 'overuse' of smartphone and 'problematic' smartphone use have been adopted in addition to, or instead of, smartphone addiction to describe the manifestations of problematic usage and maladaptive behaviours associated with the term (Tossell et al., 2015; Panova & Carbonell, 2018), whilst problematic habitual use of smartphones (i.e., unconscious automatic urges to check smartphones) has also been employed to explain problematic smartphone behaviour (Oulasvirta et al., 2012; van Deursen et al., 2015). To further complicate conceptualisation, internet-based applications such as messenger, social media and online gaming are becoming continuously more synonymous with smartphone usage (Liu et al., 2016; Giunchiglia et al., 2018), with the portability of smartphones enabling constant connectivity and accessibility to online functions. In particular, research has shown both mobile gaming and higher levels of social media to be predictors of smartphone addiction (Salehan & Negahban, 2013; Lin et al., 2016), highlighting the role of online-based applications in the risk of problematic smartphone behaviour.

Nonetheless, the lack of consensus within the field surrounding the conceptualisation of smartphone addiction is problematic as it can influence and potentially misguide research,

assessment and treatment of the issue. Whilst there is no other accepted term for a behaviour that manifests the presentation of features such as lack of self-control and increased use, extending the term ‘addiction’ to conditions that may be better described as problematic or maladaptive may undermine both the integrity and the severity of disorders that genuinely warrant it (Panova & Carbonell, 2018), and suggests that utilising non-pathological terminology is beneficial until smartphone addiction as a disorder entity is clarified. With this in mind, the current review therefore employs the term ‘problematic smartphone use’ to encompass the behaviours associated with the phenomenon (Pivetta et al., 2019). It is important to note that although research often indicates that excessive smartphone use can lead to problems for the user (Ellis, 2019), there are a number of benefits that are also afforded, such as increased social connectedness and information accessibility (Kang et al., 2015; Stawarz et al., 2019). Therefore, it is likely that outcomes of smartphone usage are proportional to exposure of the device, with too little usage depriving users of social information, and too much usage leading to the negative conclusions often reported (Przybylski & Weinstein, 2017). Nevertheless, the detrimental results of smartphone usage have led to greater impact on public opinion, with the World Health Organisation (WHO, 2015) considering excessive mobile phone use as a public health concern. This highlights the importance of establishing an operationalised definition to ensure consistency within research and to allow for a more comprehensive understanding surrounding its aetiology (Kuss et al., 2018).

In terms of assessing problematic smartphone use, much research has predominantly focused on correlational research involving psychometric tests, quantifying experiences with technology, as opposed to assessing actual problematic smartphone behaviour (Ellis, 2019). Self-report instruments assessing smartphone addiction often adopt proxy measures of usage (e.g., the Smartphone Addiction Scale; SAS; Kwon et al., 2013), using high-scores to

correlate smartphone usage with negative outcomes (e.g., Boumosleh & Jaalouk, 2017; Jasso-Medrano & López-Rosales, 2018) to provide evidence of behavioural addiction (Ellis et al., 2019). However, self-report measures are not always suitable when assessing unconscious behaviours, in addition to dynamically and naturally occurring changes in behaviours, making it difficult to advance in the conceptual understanding of problematic activities (Bentley et al., 2018; Ellis et al., 2018). A recent review by Ellis (2019) highlighted that current self-report measures of smartphone addiction do not correlate or predict simple objectively measured behaviours, and although some self-report assessments and duration estimates may correlate with objectively measured time spent on smartphones, this relationship is still rudimentary when operationalizing smartphone use (Boase & Ling, 2013). Since self-report assessments predominantly evaluate conscious measures, it is likely that that the cognitive and automatic processes that are related to problematic smartphone use (e.g., compulsivity) cannot be captured via these tools. In particular, frequent short smartphone use is hard to estimate retrospectively, and may result in distorted time perception by the user (Lin et al., 2015), indicating that self-reports are likely more beneficial in investigating the expectancies associated with smartphone behaviour (Ellis et al., 2018), as opposed to capturing these behaviours retrospectively.

Smartphone-based assessments, which allow data to be collected directly through smartphone devices, can enable the monitoring of participant behaviour in real time. This objective monitoring of behaviours is increasingly employed within research in an attempt to overcome the aforementioned methodological problems, enabling the ability to gather precise, sustained and ecologically valid data on smartphone behaviours and experiences (Miller, 2012). Perhaps the most widely used real-time monitoring is ambulatory assessment (AA), which encompasses an *active* form of monitoring, for example, ecological momentary assessment (EMA) and experience sampling, which involve momentary self-reports through electronic

diaries, in addition to pen and paper diaries and beepers, respectively (Trull & Ebner-Priemer, 2014). These methods can deliver near real time assessment by providing information on behaviours of interest as they naturally occur, subsequently minimising retrospective and heuristic biases that may distort recollections of experiences and behaviour (Trull & Ebner-Priemer, 2014; Bentley et al., 2018). However, although AA methods have been found somewhat beneficial in assessing smartphone usage (Esmaeili Rad et al., 2019), self-report EMA still predominantly relies on explicit respondent input, which does not eliminate biases, such as social desirability. Furthermore, it has been shown that EMA compliance rates erode significantly across two weeks of data collection (Schwartz et al., 2002), indicating that if applied for too long, the response burden may negatively affect the validity of response rates and measurements (Asselbergs et al., 2016).

Passive objective monitoring on the other hand is the collection of data unobtrusively, without active data entry by the participant, allowing for continuous data collection over longer periods of time (Asselbergs et al., 2016; Bentley et al., 2018). Data involving smartphone usage patterns, such as screen time, social media activity and application (app) usage can be collected, which can be beneficial in monitoring proxies of mental health, such as behavioural patterns and contextual triggers (Asselbergs et al., 2016). Indeed, recent research utilising passive monitoring has demonstrated that it is possible to predict users' affective states through smartphone notifications (Kanjo et al., 2017), highlighting the influence smartphone technology can have on mood and well-being. More generally, recent reviews evaluating passive monitoring have demonstrated how real-time measurement can facilitate assessment of dependent variables more accurately and in a less intrusive manner in comparison to self-report measures (Bentley et al., 2018; Cornet & Holden, 2018). Indeed, smartphone recorded parameters have a higher temporal resolution in comparison to self-reports, allowing fluctuations in smartphone behaviour to be detected (Markowetz et al.,

2014). The implementation of passive monitoring may therefore not only contribute to the debates surrounding problematic smartphone use conceptualisation, but also provide further validation of existing self-report scales to establish behavioural correlates of diagnostic criteria (Ellis et al., 2018). At present however, there has been no review that evaluates passive objective measures in the context of problematic smartphone use, which is a gap in knowledge that this paper aims to fill.

The present review aims to identify objective measures that have been used and/or developed to assess problematic smartphone usage, with a focus on passive monitoring as opposed to active monitoring. Since active monitoring can largely rely on respondent input, the usage patterns that passive data can provide may deliver more comprehensive information on behavioural patterns when compared across studies, which may, in turn, highlight similarities and differences in terms of problematic smartphone behaviours and the conceptualisations of the phenomenon. Therefore, the present paper aims to (i) identify objective measures that assess problematic smartphone usage, and (ii) summarise the characteristics, strengths and limitations of objective measures for assessing problematic smartphone use.

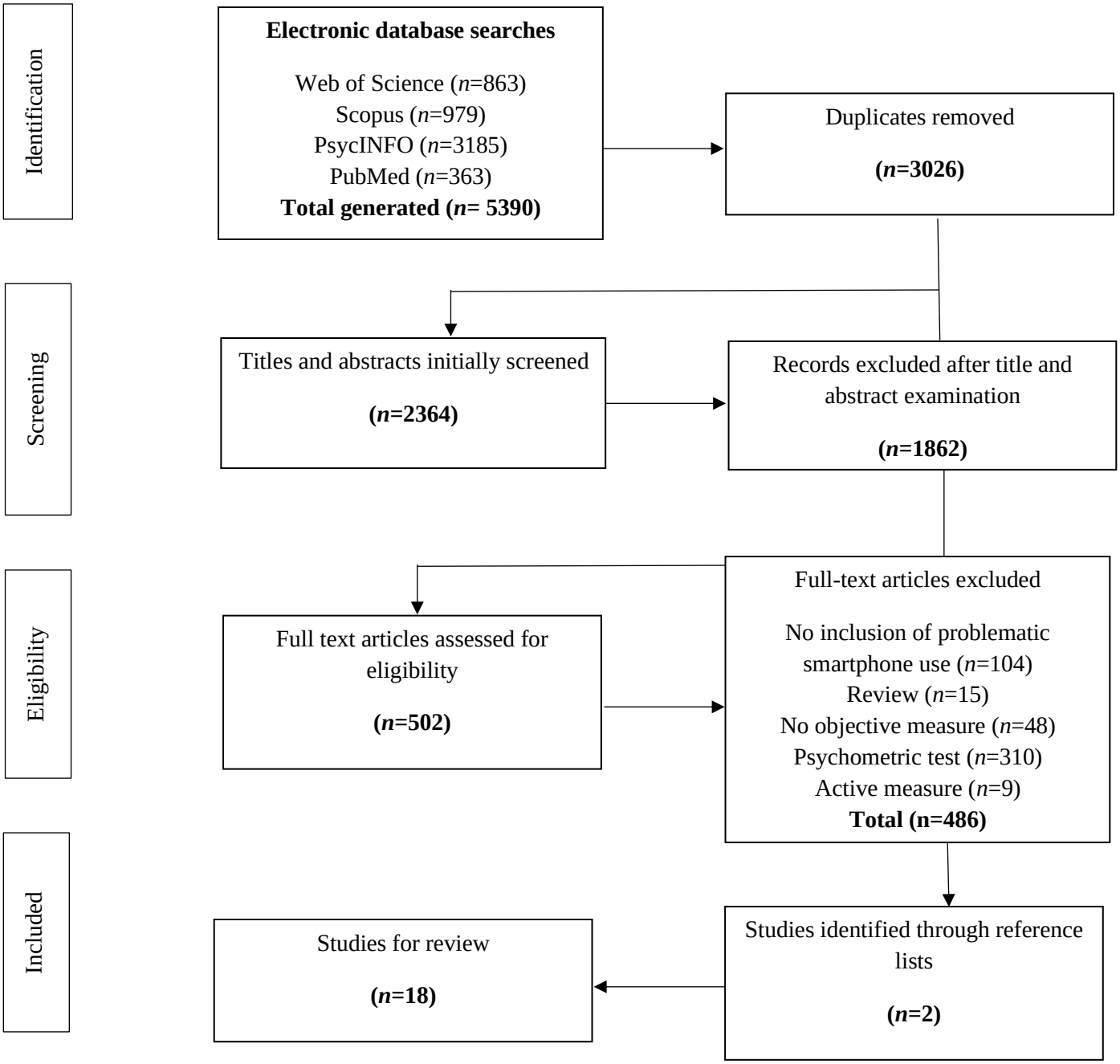
3.2 Method

The review process was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analysis statement (PRISMA; Moher et al., 2009). To identify papers for review, an extensive search was performed using Web of Science, Scopus, PsycINFO and PubMed databases. These databases were searched using the following search terms: (smartphone OR mobile) AND (addict*OR compuls* OR excess*) AND passive AND (measure* OR track* OR assess*OR app*); (smartphone OR mobile) AND (addict*OR compulsive OR excessive) AND (objective OR real-time OR app*); (smartphone OR mobile OR social network* OR social media) AND (addict*OR compulsive OR excessive) AND

behavi* AND passive AND (measure* OR tracking OR assess* OR app*) and (smartphone OR mobile OR social network*) AND screen time* AND (measure* OR tracking OR assess* OR app*). References of collected articles were also scanned for additional studies. Studies were included if they were i) published in English, (ii) published in a peer-reviewed journal, (iii) included *passive* smartphone-based assessment (i.e., the collection of data without active data entry by the user, such as the measurement of either length of time spent on device and/or number of times device is picked up), and (iv) included problematic smartphone use as a variable within the study. Papers were excluded if (i) objective measures used were a form of *active* smartphone-based assessment (e.g., ecological momentary assessment [EMA], experience sampling methodology [ESM] or ambulatory assessment [AA]), as these approaches typically rely on self-reported accounts of behaviour, facilitated through prompts and initiating responses to questions into a mobile device; (ii) used psychometric tests without conjunction of a passive objective measure and (iii) did not make reference to problematic smartphone usage (e.g., used objective assessment in the context of other addictive behaviours, such as alcohol or drugs, in addition to healthcare, i.e., if apps described are based on interventions as opposed to assessment. Although objective in nature, these do not capture behavioural markers/ patterns in the context of smartphone addiction. The title and abstract of each study were screened for eligibility. Full texts of potentially relevant studies were consequently retrieved and examined for eligibility. The search strategy is detailed in Figure 3.1.

Figure 3.1

Search strategy of the passive objective monitoring study selection process



3.3 Results

A total of 5390 studies (Web of Science *n*=863; Scopus *n*=979; PsycINFO *n*=3185; PubMed *n*=363) were initially identified. Identified duplicates were removed (*n*=3026), leaving 2364 studies for evaluation. The title and abstracts of these papers were screened, resulting in the exclusion of 1862 that were of no relevance, and a total of 502 studies which were eligible for further review. A further 489 papers were consequently excluded as they did not conceptualise smartphone use (*n*=104), did not contain an objective measure (*n*=48), only implemented psychometric tests (*n*=310), the objective measure used was *active*-based assessment (*n*=9), or they were review papers (*n*=15). Two relevant studies were also identified through reference lists. Information extracted from each study focussed primarily on (i) sample characteristics (e.g., study size, age, sex and geographical location), (ii) methodology used, including measures implemented (e.g., psychometric measures or interviews used in conjunction with objective measures), and (iii) the application used or developed to measure behaviour objectively, in addition to how the application measured behaviour (e.g., through screen time, and length of app use). A total of 18 studies were subsequently identified as relevant from the literature. These studies are presented in Table 3.1.

Table 3.1

Overview of included passive objective monitoring studies

Authors	Design and Sample	Aims	Method	App used/developed **Objective measurement of behaviour**	Findings	Strengths/limitations
Choi, Rho, Kim, Yook, Yu, Kim et al. (2017)	41, 683 logs of 48 smartphone users collected from March 8 2015 – January 8 2018. For each participant, log data were collected for an average of 15.8 days. 48 participants from South Korea recruited by polling company Hankook Research, Inc. (aged between 20-39 years, *mean age and SD not reported;* 60.42% male). 25 participants were in their 20s (control group = 11 and addiction group = 14), 23 participants were in their 30s (control group = 12 and addiction group = 11).	To derive usage patterns that were directly correlated with smartphone dependence from usage data, including apps and timeslots. To also predict smartphone dependence through data-driven prediction algorithm.	Analysis procedure consisted of: 1. Collection of smartphone usage log data. 2. Derivation of smartphone usage patterns via tensor factorisation (a reduction method to derive meaningful concepts from high dimensional data). 3. Prediction of smartphone dependence based on the patterns. Data collected over period of ten months (March 2015-January 2016). Korean Smartphone Addiction Proneness Scale for Adults (S-Scale) and interview with psychiatrist and psychologist (using Korean version of Mini International Neuropsychiatric Interview (MINI) also implemented-	"Smartphone Overdependence Management System" (Developed). Supports only Android phones. Monitoring achieved through 4 main 'sessions'. – For collection of mobile device usage data this was done in the 'Sensoring & Monitoring Session'; Mobile data usage collected included general phone usage, e.g., when phone is turned on/off and general app data (internet, SNS and game monitoring) - exact usage time and period logs monitored through background app.	Usage patterns and membership vectors are effective tools for the assessment and prediction of smartphone dependence.	Limitations: The 6 indicators that were developed and used to assess smartphone overdependence were only developed for internet dependence. App used was only available for Android phones. Strengths: Tensor factorisation can obtain meaningful patterns from large-scale data.

	There were 29 males (control group = 17 and addiction group = 12) and 19 females (control group = 6 and addiction group = 13).		used to classify control group and addicted group.			
Felisoni & Godoi (2018)	43undergraduate students from Business Adminstration of Fundação Getúlio Vargas in São Paulo, Brazil (*mean age and SD not reported;* 46.5% male).	To investigate whether increasing smartphone usage among college students has a significant impact on their academic performance.	Both survey (personal information, self-efficacy while learning and usage perception) and objective data (through apps) collected. Questionnaire also included Self-Efficacy for Self-Regulated Learning (SE:SRL scale) to assess student ability to self-regulate in learning related activities. Academic performance for the college entry exam for each student was obtained through Undergraduate's Office used as a predictor for academic performance in college. Objective data collected across 14 days.	"Moment" (iPhone) and "App Usage Tracker" (Android) Usage time is only computed when cell phones are unlocked, therefore does not include time checking time/notifications. Data collected contained total minutes on phone each day for two-week period. Average usage time subsequently calculated.	Significant negative relationship between total time spent using smartphones on academic performance. Average usage time for men = 217.7 min per day. Average usage time for women = 240.7 min per day.	Direct measurement of usage as opposed to relying on self-report data; allows observation of students' natural behaviour during the day and to collect data unrelated to own bias. Allows automatic extraction of information from students' regular routine with least intervention possible.
Lee, Ahn, Nguyen, Choi & Kim (2017)	35 college students enrolled at a public University in the Metropolitan region of northeast Asia (mean age 22.3,	To examine the similarity and variance in smartphone usage patterns between measured and self-reported data.	Both survey (demographic information, smartphone addiction scale short version (SAS-SV) and smartphone usage patterns) and objective measure implemented.	'Smartphone Addiction Management System' (SAMS). (Custom app) Android phones.	Unconscious users underestimate their usage time. Findings show that there are significant cognitive biases in actual usage patterns in self-report	Limitations: IT usage trends change rapidly, therefore continual and successive studies should be taken in a

	SD=2.4, 68.57% male).		Objective data collected over 6 weeks.	SAMS software runs in the background and measures which application, website or document is used. (Usage time, pattern and most used application types.)	of smartphone addictions.	systematic way regularly. Ambiguity in time periods measured; definition of time period, e.g., evening/night can depend on personal life and culture. This should be clarified when considering life patterns of participants. Strength: The app implemented demonstrated that there is significant cognitive bias in actual usage pattern and self-report of smartphone addictions; participants reported favourite app and usage time did not match with their most used ones. (It is proposed by the authors that underestimate of real usage time may suggest the development of tolerance).
Lee, Han & Pak (2018)	125 students; most of which attended computer classes (49% male).	To analyse smartphone addiction by considering the differences between smartphone usage patterns as well as cognition.	A standardised smartphone addiction self-diagnosis scale was used as the smartphone addiction self-diagnosis scale (based on SAS).	'How often do you use' Android system. Data was collected from the following items: total usage time, usage time by day, data usage, number of screen	Average smartphone usage based on results is more than 6hr a day. There is significant cognitive bias	Combination of self-report and smartphone data can improve the accuracy of data and ensuring data reliability from respondents.

	Age (mean and SD) and location not reported. 64 participants agreed to participate in objective data collection. These data were combined with results of addiction on Smartphone Addiction Scale (SAS) with the final dataset.		Objective data collected over a period of a month, twice a week.	turns, usage time by app, number of executions by app and frequently used apps.	between self-reports and behavioural data. The higher the 'recurrence' item, the higher the addiction. The number of times screen was turned on and/cognitive time use had the greatest influence in higher risk users.	Smartphone usage data is beneficial to be mined for useful correlations. Only 64 participants agreed to participate in objective measures from the original 125 respondents.
Lin, Lin, Lin, Lee, Lin, Chang et al. (2017)	79 young adults recruited form the Department of Electrical Engineering and Department of Computer and Communication Engineering of two Universities in northern Taiwan (mean age= 22.4 years, *SD*=2.3*;* 72.15% male).	1. To develop parameters needed to assess use/non-use reciprocity (i.e., screen off to screen on, which indicates impaired control for smartphone use). 2. To examine the predictive ability of smartphone use, non-use and use/non-use parameters when making a problematic smartphone diagnosis.	Predominantly based on App developed. Data recorded across at least 3 weeks. Psychiatrists also determined whether individual participants were smartphone addicts or non-addicts using criteria consisting of three parts: Criterion A: eight characteristic symptoms of smartphone use. Criterion B: functional impairment caused by smartphone use, or that causes distress.	App developed by authors, to support data collection on Android phones. Smartphone use parameters: screen on to successive screen off was defined as one epoch of use; the app calculated the average daily epoch count for one month as the use frequency parameter. Smartphone non-use parameters: event from screen off to screen on was defined as one epoch of non-use. Defined as maximal non-use epoch between 21:00 hours and 12:00 hours.	App-generated parameters were more associated with the App-assisted diagnosis than with psychiatric interviews alone. Frequency of use and non-use demonstrated identical prediction in relation to problematic smartphone use diagnosis.	Strengths: The high predictive natures of RMSSD and the Similarity Index imply that use/non-use reciprocity is validated with respect to the compulsive symptoms of problematic smartphone use. Limitations: Any smartphone use epoch is recorded as screen on to screen off by the app-however the app is unable to distinguish between proactive and reactive use, which may have resulted in non-use parameters being more

			Criterion C: excluded addictive behaviours that accounted for obsessive compulsive disorder or bipolar I disorders.	Use/non-use reciprocity: two parameters introduced to assess the reciprocity between use and non-use patters- Roots Mean Square of the Successive Differences (RMSSD) and Similarity Index.		accurate when predicting problematic smartphone use that the use parameters. Smartphone use and non-use were defined as screen on and screen off; this cannot wholly represent the status of smartphone use.
Lin, Lin, Lee, Lin, Lin, Chang et al. (2015)	79 young adults recruited from the Department of Electrical Engineering and Department of Computer and Communication Engineering of two Universities in northern Taiwan (mean age= 22.4, *SD=2.3;* 72.15% male).	To develop and validate proposed diagnostic criteria for smartphone addiction based on interviews with psychiatrists. To examine the relationship between smartphone addiction and the parameters generated by the app using EMD and criteria to excessive use, tolerance and time estimation. To test the differences between actual and self-aware usage time.	App recorded phone data across three weeks. Psychiatrist interviews also undertaken with participants, based on criteria of the Diagnostic Criteria of Internet Addiction for College Students (DC-IA-C) and Internet gaming disorder in DSM-5.	App developed by authors to support data collection on Android phones. App operates in background to record smartphone behaviours e.g., power on, program on, calls in/out, alarm clock, screen on/off, notifications.	Daily use count and frequency are associated with smartphone addiction (rather than duration). Self-reported time use was significantly lower than the recorded use via the app. Frequent short-period smartphone use may result in subjective distress or functional impairment. Excessive use- both frequency and duration - are part of smartphone addiction.	Limitations: Further information such as how many and what kinds of apps are used were not looked at. Data collection of one month may not be enough to allow for the detection of trends in some significant app-generated parameters. Strengths: Empirical mode decomposition (EMD) analysis was used, allowing for the ability of decomposing a complex series of smartphone use into a set of intrinsic mode functions.

Montag, Blaszkiewicz, Lachmann, Sariyska, Andone, Trendafilov, (2015)	58 participants recruited through psychology and computer sciences classes (mean age= 24.22, *SD* = 5.02; 56.9% males).	To further support studies that indicate actual smartphone behaviour constitutes a better predictor for addictive tendencies than self-reported variables. To also investigate excessive mobile phone and smartphone behaviour.	App recorded phone data across five weeks. Participants also provided self-report of average mobile phone behaviour for a week, prior installing app, for comparison against actual usage and self-report – Mobile Phone Problem Use Scale (MPPUS).	Self-developed app 'Menthal'- (non-private version, which presents no feedback to the user). Records behaviour such as incoming/outgoing calls, screen lock/unlocked and length of app use. Also recorded call and SMS related variables and computed means for average use of variable on a weekly basis. All events were associated with a user-ID and timestamp.	Weekly phone usage in hours was overestimated, while call and text message variables were underestimated. Associations between actual usage and addiction to mobile phones could be derived from recorded behaviour, but not through self-report variables.	Strengths: Overall patterns and correlations between recorded and self-reported variables and mobile phone addiction scores demonstrate recorded behaviour is more strongly associated with addictive tendencies- potential benefits in diagnostic process by direct tracking of behaviours. Limitations: Did not monitor activities in social networking sites that may have been more strongly associated with smartphone addiction compared to the present variables. First week of data discarded due to possibility results may have been influenced by being observed.
Pan, Lin, Chiu, Lin & Lin (2019)	33 adult participants (mean age= 29.48, *SD*= 10.44; 84.84% male).	To illustrate the time periods or span of weeks required to reliably infer patterns of long-term smartphone use. To investigate how long a smartphone use cycle	Self-report; The 5 item Smartphone Addiction Inventory (SPAI=5). To assess smartphone addiction. Objective measure data collection across two months.	The 'Know Addiction' database. (Custom app) Measured smartphone use patterns; predominantly frequency and use duration.	Two-week (bi-weekly) smartphone use is an adequate fundamental time unit to infer a two-month period of use.	Smartphone use episode was recorded as screen-on to screen off, providing an opportunity to distinguish between proactive and reactive use.

	could perpetuate by assessing maximum time intervals (i.e., weeks) between two smartphone use periods. To validate smartphone use and use/non-use reciprocity parameters.		Parameters developed; root mean square of successive differences (RMSSD), control index (CI) and similarity index (SI) to indicate impaired control and compulsive behaviours. Episode of smartphone use defined as a time period from screen on to the successive screen off. App calculated daily episode count as total use frequency, and total daily episode lengths were calculated as total use duration. Proactive use defined as one use episode without any notification within one minute before the screen on. Subsequently the proactive use frequency and proactive use duration were calculated.	Significant correlation found between proactive use duration in two months and smartphone addiction; suggesting that self-reported smartphone addiction may correlate with long term duration than with short term use as indicated in previous studies. However, this may be due to the adaptation of more app generated parameters within the current study.	The use/non-use parameters (RMSSD, SI and CI) allow the assessment of reciprocal patterns of smartphone use and may represent control ability of individuals; CI demonstrated better temporal stability than SI and RMSSD. Smartphone uses were defined as screen on/off, which cannot completely represent the status of smartphone use. Used a selective sample with excessive smartphone use; limited generalisability. Different smartphone use patterns may generate identical values on the temporal stability on use/non-use parameters. E.g., frequent, long use periods spread out in short intervals may generate similar CI with sparse use period with sporadic checking.

Prasad, Harshe, Kaur, Jangannavar, Srivastava, Achanta et al. (2018)	140 undergraduate and postgraduate students from a tertiary care hospital were recruited in India (mean age = 22.89, *SD*=2.79; 50% male).	To evaluate psychological correlates and predictors of excessive smartphone use with a telemetric (objective) approach.	Both psychometric tests (including the Smartphone Addiction Scale) and objective measures (three apps). Objective data collected across seven days.	'Callistics'; 'App Usage Tracker'; 'Instant' Android phone only. 'Callistics'; tracks number and duration of calls made and received from device. 'App Usage Tracker'; tracks duration of minutes spent on all apps by the user- recorded in minutes and seconds. 'Instant'; keeps track of duration in minutes spent on all apps by the user-recorded in min. It also provides the number lock/unlock cycle an individual has performed on the phone over a certain timeframe.	SAS score significantly predicted time spent on a smartphone in a seven-day period. Psychological factors predict overall smartphone usage as well as usage on individual apps. Predictors for time spent on social networking sites were ego resiliency, conscientiousness, neuroticism and openness.	Limitations: Unwillingness of participants to install apps to track usage and reset WhatsApp usage statistics. Exclusion of iOS/Windows users.
Rozgonjuk, Levine, Hall & Elhai, (2018)	101 college students recruited from a Midwestern, U.S. public university. (Mean age= 19.53, *SD*= 4.31, 76.2% female).	To investigate how self-reported levels of PSU, depression, anxiety and daily depressive mood relate to objectively measured smartphone use over one week.	Implementation of both psychometric test (SAS) and objective measure. Objective data collected over period of one week.	'Moment'; Support iOS system only. Tracks usage of screen time (time phone screen is active and unlocked) and number of screen unlocks (unlocking phone).	Self-reported PSU was positively associated with the average minutes of screen time over a week, and that it positively predicted the minutes of screen time over a week in growth curve analysis. Phone screen locks could not be predicted from PSU scores. Self-reported PSU was not significantly	Different types of smartphone usage measures e.g., screen time and screen unlocks could provide insight into PSU and negative mood from different perspectives. Time lag between web survey completion and participating in the week-long phone observation study, which

					related to the number of phone screen unlocks over a week.	may have influenced findings. Participants aware of smartphone usage being monitored, which may have increased self-criticism and self-monitoring in those with depression/anxiety monitoring, potentially influencing them to adjust smartphone usage downwardly over the study period.
Shin & Lee (2017)	195 undergraduate and graduate students from a university in Korea (age range 18-30 years, *mean age and SD not reported;* 63.59% males).	To discover the relationship between smartphone addiction diagnostic scale and smartphone usage patterns. To characterise smartphone addiction in terms of categorial usage patterns of smartphone, and to discriminate smartphone addicts from non-addicts.	Participant to install app and send average smartphone usage patterns to research. Also filled out modified version of the smartphone addiction self-diagnosis scale (S scale).	'Smartphone Usage Tracker' Android system only. Collects usage patterns; monitors the usage time of each individual's app and averages them to get the total usage time per day.	Smartphone addiction is highly correlated with communication but not entertainment. Solely measuring total usage time is not enough to predict whether a smartphone user is addicted.	While smartphone usage is more accurate, it is limited in representing the multifaced nature of smartphone addiction. Usage time does not capture psychopathological symptoms, such as compulsive smartphone usage and interpersonal conflict, implying that measuring smartphone usage alone is not sufficient enough to predict smartphone addiction.

Tossell, Kortum, Shepard, Rahmati & Zhong (2015)	34 students from both a community college and university in Houston Texas. (*Mean age and SD not reported;* 55.88% male).	To examine smartphone user behaviours and their relation to self-reported smartphone addiction through the use of both survey and telemetric data.	Quasi-experimental approach. Use of both survey (Smartphone Addiction Measurement Instrument (SAMI) and Internet Addiction Test and objective measure. Objective data collected over one year.	'LiveLab' (Custom developed) Data captured every night. Data that was collected included all application launches, the duration of application launches, and when the application launches occurred (i.e., date/time stamps). Further information such as how many texts were sent/received and URLs visited on Safari, was also collected.	Addicted users demonstrated different smartphone use as compared to users who did not indicate addiction. Addicted users spent twice as much time on their phone and launched applications almost twice as often compared to the non-addicted user. Mail, messaging, Facebook and the Web drove this use. Addictive users showed significantly lower time-per-interaction than non-addicts for the above apps.	The telemetric use data provides more depth and precision than typical survey-based research and helps to mitigate small sample sizes.
Wilcockson, Ellis & Shaw (2018)	27 students and staff from the University of Lincoln (mean age= 22.52, *SD not reported;* 62.96% female).	To examine how much time should be spent measuring mobile phone operation to reliably infer general patterns of usage and repetitive checking behaviours, and whether self-report measures of problematic smartphone use is associated with real-time patterns of use.	Both psychometric test (Mobile Phone Problem Use Scale; MPPUS) and objective measure implemented. Objective data collected across 14 days.	Custom developed app through Funf in a Box framework. Android only. Provided timestamp when the phone became active, and a second when the activity stopped and phone became inactive - primarily that involved screen use, but also included processor intensive activities, e.g., calls and playing music.	Smartphone usage collected for a minimum of five days will reflect typical weekly usage in hours, but habitual checking behaviours can be reliably inferred within two days. Objective measures did not reliably correlate with self-reported measure.	Relatively little data is required to quantify typical usage for longer periods of time. The first day of data collection was removed due to participant time differences when the app was installed, which may have implicated the inference of typical behaviour.

				Two behavioural measures were generated by the end of the day: total hours of usage and the frequency of use. (Total hours of usage determined by the amount of time the phone was active, whilst frequency of use was measured by the number of smartphone checks.)		
Ellis, Davidson, Shaw & Geyer (2019)	238 participants recruited from Lancaster, Bath and Lincoln universities and via Prolific Academic (mean age= 31.88, *SD*= 11.19, 52.10% female).	To compare the accuracy of ten smartphone usage scales and single estimates against objective measures of smartphone behaviour.	Self-report estimate on number of hours/minutes spent on smartphone daily, in addition to number of notifications received daily and how many times they pick up their device each day. Psychometric tests (Mobile Phone Problem Use Scale; MPPUS, Nomophobia Questionnaire; NMP-Q, Possession Incorporation in the Extended Self, Attachment Scale, Smartphone Addiction Scale; SAS, Smartphone Application-Based Addiction Scale; SABAS, Problematic Mobile Phone Use Questionnaire; PMPUQ, Media and Technology Usage and Attitudes Scale; MTUAS, Smartphone Use Questionnaires (SUQ-G&A).	Apple's Screen Time App. iOS system only. Measure of number of hours and minutes spent on phone, number of notifications received, and number of times device picked up.	Correlations between psychometric scales and objective behaviour are generally poor. Single estimates and measures that attempt to frame technology use as habitual as opposed to addictive correlate more favourably with subsequent smartphone behaviour.	Behavioural measures utilised were limited; use of daily tracking as opposed to finer temporal measurements based on hourly patterns of usage. System used allows participants to view their own data in real, which may have implicated correlation between self-report data and objective measure.

			Objective measure implemented; data collected from a period of one week.			
Elhai, Tiamiyu, Weeks, Levine, Picard & Hall (2018)	68 college students from a Midwestern, U.S. university (mean age= 19.75, *SD*=2.03, 64.70% female).	To examine smartphone use over the course of one week by employing a repeated measures design that allowed for direct tests of associations between depression severity and emotion regulation, in addition to the correlates involved in increased and problematic smartphone use.	Both objective measure and survey implemented: (self-report on frequency of smartphone features, Smartphone Addiction Scale-Short Version; SAS-SV, Patient Health Questionnaire-9; PHQ-9, Emotion Regulation Questionnaire; ERQ). Objective measure collected across one week.	'Moment'; Support iOS system only. Measures screen time actively used daily (time that phone is locked is not included).	Lower depression severity predicted increased smartphone use over a period of one week. Greater use of expressive suppression as an emotion regulation strategy predicted more baseline smartphone use, but less smartphone use during the week.	Strengths: Moment app ran in the background, therefore it is possible that participants did not think/forgot that their smartphone use was being monitored, subsequently maintaining their regular use over the course of the week without bias or influence. Limitations: Similarly, participants were aware that their smartphone usage was being monitored, which may have implicated their smartphone use behaviour. Due to limitations on Moment app, data on specific types of smartphone features used over the week were not acquired.
Giunchiglia, Zeni, Gobbi, Bignotti & Bison (2018)	72 undergraduate students from the University of Trento, Italy (*mean age and*	To define new metrics in representing social media use and using smartphones to both track	Objective data collection and time diaries through application used.	'iLog' (Custom developed) Both data collection from multiple sensors (hardware-	Social media app usage during academic activities (in terms of session and duration) is negatively	Limitations: small time frame of two weeks. However, in regards to time diaries this is more than usual (one week)

	SD not reported; 61.1% male).	app usage and to administer time diaries. To employ both time diaries and smartphone data to establish the correlation between social media usage and academic performance.	Academic performance assessed with two measures: Grade Point Average (GPA)- the average grade of point student obtained during the semester. Represents qualitative dimension of academic performance. Credito Formativo Universitario (CFU) - course credits obtained by students for each exam taken. Represents quantitative dimension of academic performance. Data collection across two weeks.	GPS, accelerometer, gyroscope) and software (in/out calls, apps running on device) and time diaries, consisting of three-sub questions on activities, location and social relations of students every 30 mins. Data included social media app usage (most used), screen status information (collection of data of apps that are running at the time at which they are running) and academic performance.	associated with student academic performance.	allowing a bigger window to extract patterns from through this data. Strengths: three different parameters defined (social media, usage and academic performance) - distinction allows capturing different types of usage patterns.
Lee, Lee, Ko, Lee, Kim, Yang et al. (2014)	95 college students from university in Korea (mean age= 20.6, *SD*=1.7, 70.5%).	To identify the usage patterns related to smartphone overuse and to provide several guidelines to facilitate the design of intervention software.	Survey (Smartphone Addiction Proneness Scale for Adults) and interview implemented in addition to objective measure. Data collected across an average of 27 days.	'SmartLogger' Custom app. Android only. Logs active/inactive apps, touch and text input events, web browsing URLs and notifications, power on/off, screen on/off, calls and SMS.	Compared to non-risk group, risk group has longer usage time per day and different diurnal usage patterns. Risk group more susceptible to push notifications and tend to consume more online content. Usage time and frequency correlated to smartphone overuse.	Fine-grained usage features such as session time distribution exhibited consistent patterns across datasets. Allowed for unobtrusive monitoring that has minimal impacts on user behaviour.

Shin & Dey (2013)	48 participants recruited through local university community and Android marketplace (mean age= 26.7, *SD not reported;* 70.83% male).	To explore and automated, objective and repeatable approach for assessing problematic smartphone usage.	Psychometric assessments of addiction based on Mobile Phone Problematic Use Scale (MPPUS). Individual interviews. Objective measure. Objective data collected over a period of 25.1 days.	Custom app. Android only. Collected sensory data, including apps that were installed and in use, battery usage, events and notifications and screen status data. Also extracted usage features of smartphones such as battery usage, network data usage, session usage (interval between screen turning on/off - a session indicates a unit of usage that involves app and event usage), app usage, touch inputs and push event usage (events sent form apps, e.g., new incoming SMS or email, upcoming events from calendar).	The number of apps used per day, ratio of SMSs to calls, event-initiated sessions, number of apps used event initiated session and length of non-event initiated sessions are useful in detecting problematic smartphone usage.	Strengths: Since the detection approach for problematic usage implemented is objective and automated, it can be repeated as frequently as desired. Also, low inconvenience for the user and can detect problematic use after behaviour is exhibited. Limitations: Limited to Android users. Observation deemed relatively short (3.5 weeks average) - long term data may be more insightful in terms of changes in usage depending on context.

The results section will outline the following: firstly, the methodology of studies including the demographics of the samples included, in addition to the time period of data collection. Following this, an overview of the applications that were employed within the studies and the smartphone functions that they were able to monitor, such as usage time and frequency of use, will be addressed. Lastly, the manner in which these features assess components of problematic smartphone usage will be discussed.

3.3.1 Methodology of studies

3.3.1.1 Demographics

The majority of the included studies consisted of samples recruited from academic settings, predominantly undergraduate university students (e.g., Felisoni & Godoi, 2018; Wilcockson et al., 2018), whilst two studies recruited participants through a polling company and Android marketplace respectively (Shin & Dey, 2013; Choi et al., 2017). Sample sizes ranged between 27- 238 participants (Wilcockson et al., 2018; Ellis et al., 2019), whilst the age of participants ranged between 18 -31 years old (Shin & Lee., 2017; Ellis et al., 2019). Samples were predominantly mixed, consisting of both males and females.

3.3.1.2 Time period of data collection

In terms of length of time used to assess smartphone use, time periods ranged between seven days (Elhai et al., 2018; Prasad et al, 2018; Rozgonjuk et al., 2018) to a year (Tossell et al., 2015) to collect objective data. It was suggested by Giunchiglia et al. (2018) that the two weeks used to assess behavioural data were a relatively small timeframe in comparison to other studies in computational social sciences, whilst Lin et al. (2015) indicated that data collection for one month may not be sufficient enough to detect trends in some app generated parameters. In contrast, whilst findings by Shin and Dey (2013) demonstrated that smartphone usage observed was indicative of users' routine across an average of 3.5 weeks, it

was suggested by the authors that longer term data collection would be more insightful in terms of changes in smartphone usage regarding contextual changes (e.g., differences/changes in users' schedule).

Arguably, alternative findings suggested that a minimum of five days is sufficient to reflect weekly smartphone usage, whilst habitual checking behaviours can be reliably inferred within 48 hours (Wilcockson et al. 2018). In addition, Pan et al. (2019) assessed smartphone use for a longer time frame and found that a two-week smartphone use duration was a sufficient fundamental time unit to infer a two month period of use. These findings indicate that whilst data collection using passive monitoring over a longer time frame can be beneficial in providing richer information (Shin & Dey, 2013), a longer time period of objective data collection may not be necessary, dependent on the smartphone functionalities that are observed, and the behaviour assessed.

3.3.2 Objective measures of smartphone usage

The objective measures employed collected similar data across all studies. All applications had the functionality to monitor the usage time spent on smartphones generally, in minutes or hours or via screen on/off (Shin & Lee, 2017; Elhai et al., 2018; Ellis et al., 2019; Felisoni et al., 2018; Lee et al., 2018; Prasad et al., 2018; Rozgonjuk et al., 2018). Applications that were employed and the functions that they monitored are detailed in Table 3.2.

Applications which were readily available via Apple and Android app stores (detailed below) were predominantly usage management applications, designed to assist smartphone users in understanding and regaining control of their smartphone usage. More specifically, applications such as 'Callistics' and 'Moment' also include features such as organisation of call minutes or messages and enabling phone-free time as part of their functionality. These features however, were not focussed within studies; rather, features that focused on mobile

usage behaviours (such as incoming and outgoing calls, or time spent on apps) were assessed. This excluded any explicit input by the user, ensuring that data collection remained as passive monitoring. Likewise, of the applications constructed, these were developed to measure smartphone usage in terms of usage patterns deduced by monitoring features such as app launches and screen on/ off frequency (e.g., Lee et al., 2015; Montag et al., 2015). None of the bespoke applications were specifically developed to measure problematic smartphone use, but rather to assess usage and patterns of smartphone behaviour. All applications that were employed within the present studies were identified as passive objective measures, as they ensured unobtrusive data collection, without explicit data entry by the participants.

Eleven studies developed custom applications to measure behavioural smartphone usage (Shin & Dey; 2013; Lee et al., 2014; Lin et al., 2015; Montag et al., 2015; Tossell et al., 2015; Choi et al., 2017; Lee et al., 2017; Lin et al., 2017; Giunchiglia et al., 2018; Wilcockson et al., 2018; Pan et al., 2019). The remaining seven studies implemented applications that were either a feature already available on the smartphone or downloadable from the Android or Apple app stores. These applications included the 'Moment' app (Apple iOS; Elhai et al., 2018; Rozgonjuk et al., 2018), 'App Usage tracker' (Android; Felisoni & Godoi, 2018; Shin & Lee, 2017), 'Callistics', 'Instant' (Android; Prasad et al., 2018), 'How Often Do You Use' (Lee et al., 2018) and Apple's 'Screen Time' feature on the iOS system (Ellis et al., 2019). For the 'Moment' and 'App Usage Tracker' applications, usage time spent on the smartphone was the only functionality that was monitored, computed when the smartphone is locked and unlocked (Shin & Lee, 2017; Elhai et al., 2018; Felisoni & Godoi, 2018; Prasad et al., 2018; Rozgonjuk et al., 2018). To utilise additional functionalities, 'Callistics' and 'Instant' were also employed by Prasad et al. (2018), which monitor the number and duration of calls made and received from the smartphone, in addition to keeping track of the duration spent on all apps, and the number of locks/unlocks on the smartphone,

respectively. The ‘Screen Time’ feature and ‘How Often Do You Use’ applications on the other hand contained multiple functionalities to monitor different aspects of smartphone usage in addition to usage time. These included the number of notifications received, the number of times the device was picked up, the number of times the app was launched and data on the most frequently used apps (Ellis et al., 2019; Lee et al., 2018).

In terms of the applications that were developed, these were similar to the pre-existing applications available in regard to their functionality and the measures of behavioural data collection. Out of the eleven apps developed, six monitored smartphone usage time, in addition to functions such as when the smartphone was switched on or off, application data (e.g., internet/game monitoring), smartphone pickups/checks, notifications, screen status information and most used social media apps (Shin & Dey, 2013; Lee et al., 2014; Choi et al., 2017; Lee et al., 2017; Giunchiglia et al., 2018; Wilcockson et al., 2018). Screen on and off episodes were measured in three studies to assess usage patterns (Lin et al., 2015; Lin et al., 2017; Pan et al., 2019). In these three studies, screen on to successive screen off were defined as one epoch or episode of use, the average count of which was then calculated to provide the frequency of use (Lin et al., 2015; Lin et al., 2017; Pan et al., 2019).Time-stamps during monitoring was also used in three studies (Montag et al., 2015; Tossell et al., 2015; Wilcockson et al., 2018); when application launches occurred on the smartphone (Tossell et al., 2015), when the phone became active and inactive (Wilcockson et al., 2018), in addition to all events being monitored (e.g., calls, screen lock/unlock and length of app use; Montag et al., 2015).

Consistent with the features of passive objective assessment, all applications employed within the present studies allowed for the collection of data without extra user input by the participants involved. Data collection was unobtrusive in nature, enabling a variety of smartphone interaction and behaviours to be assessed through functionalities such as screen

time and screen locks/unlocks. A handful of studies also included the measurement of notifications received by the user (e.g., Lee et al., 2014; Lin et al., 2015) which although can be objectively monitored, are not a direct measure of behaviour. Yet, in the context of problematic smartphone use here, notifications were viewed as a cue for triggering problematic smartphone behaviour, and were subsequently monitored to predict user behaviour through assessing how notifications act as a request for user attention and observing how users respond (Lee et al., 2014; Kanjo et al., 2017; Ellis et al., 2019).

Table 3.2

Applications employed and features monitored

		Times device picked up	Hours/mins on phone	Screen on/off	Calls in/ out	SMS sent/received	Web URLs	App launches	Most used apps	Length of app use	Notifications	Timestamps
Available through app store	Moment			✓								
	Callistics				✓					✓		
	App Usage Tracker			✓					✓	✓	✓	
	Instant			✓						✓		
	Smartphone Usage Tracker									✓		
	How Often Do You Use		✓	✓				✓	✓	✓		
	Apple Screen Time	✓	✓								✓	
Bespoke app	Smartphone Overdependence Management System			✓				✓		✓		
	Smartphone Addiction Management System		✓						✓	✓		
	Menthal			✓	✓	✓				✓		✓
	Know Addiction			✓							✓	
	LiveLab					✓	✓	✓		✓		✓

3.3.3 Objective assessment of problematic smartphone use

3.3.3.1 Usage time

All passive objective measures had the ability to monitor usage time spent on smartphones. Smartphone usage was assessed by the total usage time in minutes and hours (e.g., Shin & Dey, 2013; Montag et al., 2015; Shin & Lee, 2017; Elhai et al., 2018; Ellis et al., 2019; Felisoni & Godoi, 2018; Lee et al., 2018; Prasad et al., 2018; Wilcockson et al., 2018), albeit there were differences in terms of the parameters being measured to assess usage within these studies. For three studies, usage was monitored via screen time, tracked when the phone was unlocked and the phone screen was active (Elhai et al., 2018; Felisoni & Godoi, 2018; Rozgonjuk et al., 2018). In these, the average usage was then calculated for screen time per day (Felisoni & Godoi, 2018), per week (Rozgonjuk et al., 2018) and both weekdays and weekends (Elhai et al., 2018). Findings demonstrated that males spent an average of 217.7 minutes per day on their smartphones, whilst women spent an average of 240.7 minutes per day (Felisoni & Godoi, 2018). Furthermore, this study also focussed on the impact of excessive smartphone use on academic performance, in which academic performance was assessed through the Self-Efficacy for Self-Regulated Learning scale (SE: SRL; Zimmerman, Bandura & Martinez-Pons, 1992), in addition to performance on students' entrance exam. A significant negative relationship was found between the total time spent on smartphones on academic performance (Felisoni & Godoi, 2018). On the other hand, Elhai et al. (2018) indicated that increased smartphone use over a week was predicted by lower baseline depression severity, whilst findings by Rozgonjuk et al. (2018) found that self-reported problematic smartphone use was also positively associated with the average minutes of screen time across one week.

In addition to length of smartphone usage, three studies also included additional functions during data collection and analysis (Montag et al., 2015; Lee et al., 2018; Prasad et al., 2018).

These included data usage and number of screen turn ons (Lee et al., 2018), session usage and app usage (Shin & Dey, 2013), in addition to incoming and outgoing calls, screen lock and unlock, and app usage (Montag et al., 2015; Prasad et al., 2018). Findings by Shin and Dey (2013) demonstrated that individuals spent an average of three hours a day on their smartphone, and executed applications 147.7 times per day. It was observed that the average number of usage sessions per day across all users was 89.9, whilst users who were assessed as having greater problematic smartphone use also used more apps and increased interaction sessions (Shin & Dey, 2013). On the other hand, Lee et al., (2018) suggested that individuals at high risk of problematic use were those that turned their screen on more than 110 times per day and spent more than 72.5 hours per week on their smartphone. It was also indicated that the higher number of screen turn ons was the greatest influence within those at high risk, with higher number of screen turn ons leading to greater differences between the actual usage time and perceived usage time, suggesting that high risk users were unable to identify their actual usage time (Lee et al., 2018). Similarly, findings by Montag et al. (2015) demonstrated that aggregated weekly mobile phone usage was overestimated by users, whilst more specific behaviours (e.g., outgoing calls) were underestimated. In contrast, findings by Prasad et al. (2018) demonstrated that individuals with problematic usage (as indicated by the SAS) spent significantly more time on their smartphone and performed more lock-unlock cycles. More specifically, females also spent longer durations on calls, photo gallery and camera, whilst males predominantly used video streaming applications and smartphone-based academic apps (Prasad et al., 2018). This suggests that although general usage time was the most monitored function across studies, more specific functions such as applications executed may be more informative in terms of pinpointing certain smartphone features that are associated with problematic smartphone usage and its consequences.

3.3.3.2 Frequency of use and checking behaviours

Studies observing checking behaviour patterns or habitual problematic usage analysed different functionalities in terms of the objective measures used. To assess habitual checking behaviours, Ellis et al. (2019) focused on the number of pickups and notifications on the phone, in addition to hours of use. Although it was highlighted that the number of notifications received is not a measure of behaviour, it was used within this study as a predictive measure on the number of times the user may pick-up or check their smartphone. In contrast, Wilcockson et al. (2018) implemented timestamps to monitor when the phone became active and inactive, generating frequency of use (i.e., phone checks, defined as any usage lasting <15 seconds) in addition to total hours of usage. It was observed that smartphone behaviours across all users were highly predictive of total smartphone usage and checks, whilst usage was also similar during weekdays and weekends, and it was further indicated by the authors that multiple checks could signal absent-minded smartphone use, subsequently suggesting more habitual behaviour that is automatic. Tossell et al. (2015) used a similar method in terms of implementing timestamps to monitor when applications were launched, in addition to data on the duration of application launches, how many texts were sent and received, and URLs visited online. Time per Interaction (TPIs) rates were calculated, where lower TPIs reflect app usage that is short in duration and more frequently launched, and higher TPIs reflect longer duration usage, but with less frequent app launches. It was observed that lower TPI rates were exhibited by individuals addicted to their smartphones, suggesting that shorter and more fragmented interactions are more likely to lead to habitual usage patterns.

Bespoke applications implemented in two studies also calculated the average daily epoch (defined as smartphone use from screen on to successive screen off). Empirical mode decomposition (EMD) was employed, whereby the underlying structures of the time series

can be deduced to analyse the app generated parameters. In particular, trends of frequency, duration and median use were calculated, with frequency and duration testing the criterion of "excessive use", and duration and median for "tolerance" (defined as a marked increase in the duration of smartphone use to achieve satisfaction) (Lin et al., 2015). Findings illustrated excessive frequency of use as >68.4 counts per day, and a cut-off point of 4.6 hours per day for duration (Lin et al., 2015; Lin et al., 2017), suggesting that short periods of frequent use may result in subjective distress or functional impairment (Lin et al., 2015). The assessment of the mean trend was also significant in identifying tolerance, demonstrating the use of EMD analysis as beneficial in evaluating parameters associated with problematic smartphone use, and indicating that excessive usage, including both frequency and duration, contribute to problematic smartphone use. Following this, a further app prototype calculated the reciprocity between smartphone use and non-use epochs (Lin et al., 2017) to evaluate compulsive smartphone behaviour. It was found that use frequency, duration and median, in addition to non-use frequency, predicted problematic smartphone use, whilst non-use duration and non-use median parameters predicted non-problematic smartphone use. These patterns subsequently indicated the extent of impaired control of smartphone use, corresponding to that of compulsive symptoms presented in problematic behaviour (Lin et al., 2017), demonstrating the assessment of use and non-use reciprocity advantageous in identifying the nuances of problematic smartphone usage.

Similarly, Pan et al. (2019) defined an episode of smartphone use as screen on to successive screen off. In this study, usage was distinguished between "proactive" and "reactive", where proactive use was defined as one episode without a notification within one minute before screen on. Proactive usage was described as more reflective of compulsive smartphone behaviour, as it reveals more information on the intention of usage, such as checking for notifications or messages, which can contribute to the assessment of reciprocal usage patterns

that reflect the control ability of individuals (Pan et al., 2019), suggesting that shorter interactions and checking behaviours are likely to play an important part in driving smartphone behaviour, and may be a potential source in the development of problematic usage.

3.3.3.3 Rewards

In terms of rewards, whereby individuals use their smartphones to gain instant gratifications, Lee et al. (2014) monitored functions such as active/ inactive applications, web browsing URLs, notifications and screen locks/unlocks. Subsequently, aggregated usage, session-level usage and temporal usage patterns were analysed to identify usage patterns within problematic risk individuals and non-risk individuals. Findings demonstrated that usage time and frequency were related with smartphone overuse, suggesting that repeated usage for mood adjustment purposes may depend mainly on function as opposed to usage amount, and that this may subsequently lead to the formation of habitual usage and addictive behaviours (Lee et al., 2014).

In addition, it was demonstrated in two studies that users seek out specific content to satisfy certain needs, which influenced the development of problematic smartphone use (Elhai et al., 2015; Tossell et al., 2015). As aforementioned, Tossell et al. (2015) monitored data regarding application launches, text messaging and URLs visited online, followed by the calculation of TPIs. Findings also showed that problematic users spent more time on Mail, Facebook, Entertainment and Safari applications as opposed to non-problematic users, and it was indicated that phone checking satisfied an uncontrollable urge, which was demonstrated across all users considered smartphone addicts, indicating that rather than being addicted to the smartphone itself, it is the content to which the phone provides access that can lead to addictive behaviours (Tossell et al., 2015). Conversely, although findings illustrate problematic users spending more time on entertainment than non-problematic users, it was

highlighted that there were no differences between users in terms of smartphone gaming (Tossell et al., 2015). Similar results were reflected by Shin and Lee (2017), whereby online gaming was not associated with problematic smartphone use. However, one study found gaming to be significantly associated with problematic usage (Choi et al., 2017), suggesting that nuances regarding smartphone users and their personal affordances should be considered when assessing for problematic smartphone use.

In contrast, Elhai et al. (2015) focused on the daily averages of smartphone usage to observe smartphone gratifications in the context of psychopathology. Here, it was found that whilst lower depression severity was associated with decreased smartphone use, increased smartphone use was observed for individuals who used expressive suppression as a maladaptive emotion regulation strategy, and it was suggested that expressive suppression may be gratified by an increase in smartphone use as a specific medium (Elhai et al., 2015). This suggests that distinguishing between general smartphone usage and the affordances that they provide is important when assessing for problematic usage, as it can allow further understanding into problematic use to smartphones as a medium, and how different affordances available can also lead to problematic use.

3.3.4 Additional assessments of problematic smartphone use employed in conjunction with objective monitoring

In addition to objective monitoring, 15 studies included a self-report measure to assess smartphone usage and addiction. These included variations of the Smartphone Addiction Scale (Lee et al., 2017; Elhai et al., 2018; Ellis et al., 2019; Prasad et al., 2018; Rozgonjuk et al., 2018), variations of the Smartphone Addiction Proneness Scale (SAPS; Kim et al., 2014; Lee et al., 2014; Choi et al., 2017), the Mobile Phone Problematic Use Scale (MPPUS; Bianchi & Phillips, 2005; Shin & Dey, 2013; Montag et al., 2015; Ellis et al., 2019;

Wilcockson et al., 2018) and the five item Smartphone Addiction Inventory (SPAI-5; Lin et al., 2014; Pan et al., 2019).

Of these, ten studies implemented psychometric tests to assess the association between self-reported smartphone usage and behaviour in comparison to actual usage (e.g., Prasad et al., 2018; Ellis et al., 2019), whilst four used psychometric tests to classify addicted or not addicted groups (e.g., Lee et al., 2014; Shin & Lee, 2017) using cut-off scores of 30 for the SAS-SV (Lee et al., 2017), ≥ 40 for the SAPS and ≥ 29 for the Smartphone Addiction Self-Diagnosis Scale (S-scale; Shin & Lee, 2017) to be indicative of addictive smartphone use. The SAPS, SPAI-5 and MPPUS were found to be positively associated with smartphone behaviour (Shin & Dey, 2013; Lee et al., 2014; Pan et al., 2019). Findings by Ellis et al. (2019) however, indicated that the MPPUS did not reliably correlate with the objective measures; scores were unable to predict the number of smartphone checks or total use across the period of objective data collection, indicating that such scales perhaps struggle to capture problematic behaviour that is atypical and habitual in nature. The SAS on the other hand resulted in significant positive correlations when analysed against general smartphone use objective measures (e.g., Prasad et al., 2018; Rozgonjuk et al., 2018).

In addition, three studies employed interviews to assess problematic smartphone use, of which all were found to predict problematic behaviours (Lin et al., 2015; Choi et al., 2017; Lin et al., 2017). These were conducted using the Diagnostic Criteria of Internet Addiction for College Students (DC-IA-C; Ko, Yen, Chen, Chen & Yen, 2005; Lin et al., 2015) and the Mini International Neuropsychiatric Interview (MINI; Sheehan et al., 1998; Choi et al., 2017). In addition, one study based the interview on criteria consisting of (i) characteristic symptoms of problematic smartphone use (e.g., persistent desire and/or unsuccessful attempts to cut down or reduce smartphone use), (ii) functional impairment caused by smartphone use (e.g., jeopardized or lost a significant relationship, job or educational/career opportunity due

to smartphone use), and (iii) excluded addictive behaviour that accounted for obsessive compulsive disorders or bipolar I disorders (Lin et al., 2017). These results indicate that interviews used to assess for problematic usage may be more beneficial than psychometric tests to predict and capture problematic behaviours, particularly in regard to smartphone checks and total smartphone use time, supporting previous research that has found increased accuracy when combining both psychiatric interview and objective smartphone data (Lin et al., 2017). However, employing objective assessments in conjunction with psychometric measures may be useful in highlighting the more nuanced behaviours associated with problematic smartphone use, and may provide further clarification into how these behaviours align with potential diagnostic criteria and psychological constructs (Ellis et al., 2018).

3.4 Discussion

The present review aimed to identify passive objective measures that are available and employed to assess problematic smartphone use. A total of 18 smartphone-based assessments that were used to monitor smartphone behaviour were reviewed. A number of functionalities were demonstrated, with general screen time use and smartphone checks being among the most monitored. The extent to which these functionalities capture problematic behaviour and smartphone use are discussed.

3.4.1 Assessment of problematic usage

Usage time, in particular overuse of smartphones, is often the most utilised variable when assessing problematic smartphone behaviours (Ellis et al., 2018), and was the most predominant function observed across all of the present studies, monitored through screen time (calculated either via screen locks/unlocks or screen time in hours or minutes). In particular, five of the reviewed studies indicated that an individual is considered a problematic user if their usage time exceeds a predefined usage amount (Lee et al., 2014; Lin

et al., 2015; Lin et al 2017; Felisoni et al., 2018; Lee et al., 2018), which can be beneficial in terms of modelling further understanding of problematic smartphone usage when considered as a variable within research (Gökçearslan et al., 2016). However, the cut-off times across these studies ranged between four to eight hours per day, the variability of which limits comparisons within findings and may further warrant issues when trying to establish the conceptualisation of problematic usage and the potential development of diagnostic criteria. This emphasises that a standardised baseline needs to be implemented to allow for comprehensive comparison and distinguishing between problematic and non-problematic use, if utilising a pre-defined usage cut-off is to be considered as a measure within research and especially if it were to extend into clinical assessment.

In addition, an excess of smartphone usage time does not necessarily indicate problematic behaviour (Andrews et al., 2015). Smartphone developments and increased internet access via these devices have meant that individuals are increasingly using their smartphones for a variety of things and for some, smartphones have become a substitute for the computer (Aljomaa et al., 2016), which can undermine methods of employing a cut-off time to distinguish between problematic and non-problematic usage if they are increasingly being used for work or informational purposes (LaRose et al., 2003). However, one functionality that was employed within the present objective measures was the monitoring of specific applications, including when they were launched and the length of time being spent on these applications (e.g., Choi et al., 2017; Lee et al., 2018). These measures can deduce what the user is engaged in whilst on their smartphone and can be highly beneficial in distinguishing between ‘problematic’ and ‘required’ usage (Ryding & Kaye, 2018). For instance, it has been shown that problematic users tend to spend more time on social networking or communication sites, as opposed to educational purposes (Kormas et al., 2011; Wu et al., 2013; Pivetta et al., 2019); findings which were consistent within the present review,

demonstrating Facebook as one app most frequently engaged with by problematic users (Tossell et al., 2015). However, findings also illustrated there to be no differences between problematic users and non-problematic users in regard to gaming (Tossell et al., 2015; Shin & Lee, 2017). This is contrary to previous research indicating gaming is a predictor of problematic usage (Lin et al., 2016), albeit this may be due to the genre of game in the present studies. Specifically, it has been demonstrated that the genre of gaming is platform-specific, with smartphone gaming more ephemeral in comparison to online games via PC (Jin et al., 2013), which is likely to lead to less immersive gaming interactions and subsequently lesser association with problematic smartphone use, which may reflect the results of the present review. This highlights that nuances surrounding gaming on smartphones need to be specified, so that affordances are clearly explored and understood as an entity in the conceptualisation of problematic smartphone use, particularly since internet-mediated gaming through smartphone may be classified under the remit of Gaming Disorder (GD) (Ryding & Kaye, 2017). Nevertheless, the findings of the present review highlight the importance of distinguishing between affordances available via smartphones, to further understand users' problematic usage of smartphones as a medium, in addition to how differential content types can lead to problematic smartphone use.

The notion of habitual smartphone use is often employed to explain problematic smartphone behaviour (van Deursen et al., 2015; Anshari et al., 2016; Lee et al., 2017), whereby habitual use is strongly influenced by frequency of behaviour, such as checking the smartphone (Neal et al., 2012). A number of studies within the present review utilised various functions to monitor checking behaviour patterns and frequency of use, including timestamps, screen on and off counts (e.g., Tossell et al., 2015; Lin et al., 2017), and notifications (Ellis et al., 2019). Although notifications are not an assessment of behaviour, they can be used as a predictive measure in checking behaviour and are a more ecologically valid means of

assessment in comparison to traditional methods, which cannot provide continual monitoring of usage patterns (Kanjo et al., 2017). Moreover, lower Time per Interaction rates (calculated as duration in seconds/ number of launches) were exhibited by individuals with problematic smartphone use, indicating that shorter and more fragmented interactions are more likely to lead to habitual usage patterns (Tossell et al., 2015), whilst use and non-use reciprocity patterns provided the ability to observe compulsive behaviours associated with problematic usage (Lin et al., 2017). Monitoring such variables can therefore provide a better measure of preoccupation with smartphones, whereby multiple checks are indicative of absent-minded, habitual usage (Wilcockson et al., 2018). It should be noted however, that habitual smartphone usage is not necessarily negative in nature; it can have a positive social feature by characterising an individual and predicting one's action, in addition to enabling multitasking in certain situations (Wood & Neal, 2007). Rather, maladaptive habits can cause unintended behaviour that is activated by internal or external cues, for instance, when a user experiences urges, such as unintended smartphone checking for notifications (van Deursen et al., 2015). Research has demonstrated that behaviour is controlled less by intentions when habit increases strength (Danner et al., 2008), indicating that problematic smartphone usage is better described as a struggle to maintain effective self-regulation over maladaptive habit driven behaviour, in which habit and problematic usage, through loss of self-control, are part of the same continuum (Oulasvirta et al., 2011). This signifies that checking habits constitute an important part in the behaviour driving smartphone use, making them a potential source of problematic behaviours (Oulasvirta et al., 2011), which should not be overlooked in future research that aims to further understand problematic smartphone use.

3.4.2 Methodological challenges of objective passive monitoring

Although there are advantages of utilising objective passive monitoring within smartphone use research, there are also numerous challenges associated with this type of assessment.

Firstly, the time period of objective data collection varied considerably across studies, ranging from one week to one year (Tossell et al., 2015; Elhai et al., 2019). Generally, longer periods of data collection are considered more advantageous, allowing for the potential to produce richer information concerning patterns that may not be prominent in shorter studies (Tossell et al., 2012). However, it is crucial with real-time monitoring that participant compliance rates are considered. Although passive smartphone-based assessments are unobtrusive in nature and less burdensome than active monitoring, these types of assessment can have a noticeable impact on battery life on the device, which can lead to a decrease in user motivation and increased potential of participant dropout (Boonstra et al., 2018; Bentley et al., 2019). However, it was highlighted in the present findings that a minimum of five days was enough to reflect weekly smartphone usage, while habitual behaviours can be reliably inferred within 48 hours (Wilcockson et al., 2018). Similarly, findings by Pan et al. (2019) demonstrated that assessing smartphone use duration across a two-week period was sufficient to infer a two-month period of smartphone usage, indicating that it may not be necessary to collect smartphone data across a long timeframe. Nevertheless, it is likely that the time-period of data collection for smartphone usage patterns is dependent on the functionalities and variables being assessed, and should be considered carefully in future research to ensure optimisation of passive data monitoring, particularly when utilised within longer studies.

Secondly, participant privacy must be considered at all times, especially if data collection is perceived as personal, such as recording the content of messages or phone calls (Bentley et al., 2019). Collecting such data can adversely impact user engagement and behaviour, particularly if their privacy is not guaranteed (Tossell et al., 2012). It has been indicated that

individuals are more reserved when commercial interests are concerned (Bietz et al., 2015), which may be attributed to lack of trust in technology ensuring data that is collected is kept confidential or scepticism that the information gained from passive monitoring is accurate and beneficial (Dennison et al., 2013; Torous & Roberts, 2017). Whilst ethical considerations were reported in several studies within the present review (e.g., Lee et al., 2017; Felisoni et al., 2018), this highlights that privacy constraints are ensured within future studies. For example, the rationale of the study and the anonymisation process must be detailed prior the commencement of the study so that participants are aware of how their data are used, whilst researchers should implement methods, such as encryption to retain important data without collecting sensitive data (Cornet & Holden, 2018; Tossell et al., 2012).

Furthermore, analysing real-time behavioural monitoring is also complex in comparison to self-report assessments (Ellis et al., 2018). Particularly when data are collected continuously as with passive monitoring, data sets can become extremely large, with previous research demonstrating that a total of up to 9000 data points can be collected across a period of four weeks for each participant, dependent on the functionalities monitored (Boonstra et al., 2018). In addition, it is also difficult to map passive objective data onto specific variables of interest during research (Bentley et al., 2019). However, although the large volume of data may make data interpretation more cumbersome, developments in the area of experience sampling may help to improve the complexities of passive data collection interpretation, facilitating adoption within smartphone-based research, whilst pre-built applications such as the Screen Time feature on iOS can provide access to simpler behavioural metrics (Thai & Page-Gould, 2017; Ellis et al., 2019).

3.4.3 Recommendations for future research

Considering the findings of the present review, six functionalities are recommended for researchers when assessing problematic smartphone usage: general usage time in (i) hours or minutes or (ii) screen on/off, (iii) most used applications, (iv) application launches and (v) length of app use and (vi) notifications.

Firstly, although general time spent on smartphones, either through hours or minutes, or screen on/off, can lack specificity in terms of patterns of usage, overuse of time spent on smartphones can model problematic smartphone use and provide a basis for discovering influential factors contributing to problematic usage (Shin & Dey, 2013). However, consideration of contextual factors must be made, particularly if a pre-defined cut-off time to establish problematic use is implemented. Ideally, functionalities such as most used applications, app launches, and length of app use should be employed in conjunction with general usage time to enable insight into what the user is engaged in on the smartphone, and can be beneficial in distinguishing between 'problematic' and 'required' usage (Ryding & Kaye, 2018). In addition, frequency of use can be calculated via these functions to indicate habitual usage patterns, whilst notifications can indirectly predict checking behaviour, which can be indicative of absent-minded smartphone use.

It is also emphasised that future research addresses privacy more explicitly. Whilst passive monitoring can be beneficial in defining the behaviours associated with problematic smartphone use, future studies must comprehensively assess the acceptance and long-term implementation of passive monitoring, as well as any adverse consequences that may arise through these means of data collection (Holden & Karsh, 2010; Cornet & Holden, 2018).

3.4.4 Avenues for intervention in problematic smartphone use

Objective monitoring of smartphone behaviour can provide further directions in developing appropriate digital interventions in the field of problematic smartphone use. Although a number of applications have been developed to help users regulate their smartphone use, these applications lack psychological underpinning and are often not adaptable or tailored to address the specific needs of different people (van Velthoven et al., 2018). Having the ability to assess the nuances of user behaviour via real-time monitoring can help towards identifying, understanding and challenging the underlying motivations in individual users, and allow for these behaviours to be targeted in detail within smartphone regulation apps (van Velthoven et al., 2018).

3.4.5 Limitations

The present review is not without its limitations. Active smartphone-based assessments, such as EMA, were not included as they fell outside the scope of the review. In addition, due to the focus on smartphone functionalities, the review did not incorporate broader literature on specific psychological constructs (Griffiths, 2005), such as body image, BDD or well-being, which may implicate conclusions drawn regarding the extent passive objective data can operationalize specific constructs associated with problematic smartphone usage.

3.5 Conclusion

Overall, passive objective monitoring has vast potential in the domain of problematic smartphone usage, enabling the ability to gather both precise and ecologically valid data on real-time smartphone behaviour. As presented within the present review, applications within smartphones provide numerous functionalities, which can run in the background to capture both checking and usage behaviours and patterns across time. Despite the challenges associated with passive monitoring, when employed appropriately, these can drive both

theoretical and practical developments surrounding the assessment and conceptualisation of problematic smartphone use and contribute to providing valuable insight within technology use research. Given this, Chapter 7 will employ the use of passive objective monitoring to explore the viability of three of the six recommended functionalities in assessing problematic usage: (i) general screen time in hours or minutes, (ii) application launches and (iii) notifications, in the context of SNS.

3.6 Aims and research questions

Throughout the introductory chapters, it has been highlighted that there exists a lack of knowledge regarding SNS, body image, BDD and associated well-being outcomes. There has been no research to date that has examined the interplay between SNS engagement whilst living with BDD, or that has explored the experience of SNS in BDD from the perspective of health professionals in the BDD field. Moreover, there remains a lack of research that has explored SNS, body image and well-being through the use of objective monitoring. Therefore, the purpose of this doctoral project was twofold: i) to investigate the role of SNS (in particular Instagram) usage patterns on psychological well-being outcomes and ii) to identify and understand the features of SNS (and Instagram) use that may influence well-being outcomes from the perspectives of Instagram users, individuals experiencing BDD and clinicians working in the field of BDD. Moreover, this project aimed to answer the following research questions:

1. What are the features of SNS (Instagram) that contribute towards body dissatisfaction and well-being outcomes?

2. In what ways do Instagram usage patterns influence well-being?

3. What is the role of appearance anxiety in the relationship between Instagram use and well-being?

4. How feasible is passive objective monitoring to assess and understand usage patterns on well-being outcomes?

5. How do individuals with BDD make sense of their experience whilst using SNS?

6. How do BDD clinicians make sense of SNS in BDD?

PART III: METHODOLOGY

CHAPTER 4

Research Design and Methodology

4.1 Introduction

As presented in the introductory chapters, research on SNS use, body image and well-being is a multidisciplinary field, and has resulted in the use of different approaches to explore different aspects around each of these topics, respectively, such as self-report, experimental designs and objective monitoring (e.g., Cash & Smolak, 2011; Kleemans et al., 2018; Rozgonjuk et al., 2018; Hogue & Mills, 2019). Indeed, there is no single approach that can fit all studies, but rather a variety of different approaches and methods can be used for different situations and research questions. However, the adoption of a holistic approach can contribute to further understanding the nuances and influence of SNS on a number of well-being outcomes. This chapter will give an overview of the research design, methodology and paradigm adopted within this project, in the context of SNS use and psychological well-being.

4.2 The mixed methods approach

Mixed methods approaches are characterised by the combination of quantitative and qualitative methods. Generally, quantitative and qualitative methods have advantages and disadvantages that pertain to each respective method. For example, qualitative research may have problems of generalizability due to small samples sizes, whilst quantitative methods may be limited in their ability to ascertain deeper underlying meaning and explanations (Rahman, 2016). On the other hand, qualitative methods benefit from producing detailed descriptions of participants' experiences and feelings, and quantitative research can benefit in its generalizability to whole or sub-populations (Rahman, 2016). A mixed methods approach

however can lessen the flaws of both quantitative and qualitative approaches by compensating or remedying the disadvantages of the other (Cresswell, 2013).

Combining both qualitative and quantitative research approaches can enable triangulation, which can seek convergence, corroboration and correspondence of results from the different methods used, in addition to achieving complementarity, whereby the strengths of one method can be used to enhance and clarify the results of the other method (Schoonenboom & Johnson, 2017). More recently, divergence of results, where dissimilar results are yielded from the different methods used, have also been recognised as beneficial in allowing deeper insight and explanations into complex aspects of phenomena (Doyle et al., 2016; Yu & Khazanchi, 2017). As such, an integration of both qualitative and quantitative approaches should allow the answering of research questions beyond those that can be answered by the pure approaches (Johnson & Onwuegbuzie, 2004). Within the present project, a multistage mixed methods approach was adopted. This approach allows for strands of quantitative (online surveys; smartphone data) and qualitative data (interviews and focus groups) to be collected simultaneously and results to be merged during interpretations to identify convergence, divergence or relationships between the data sets. This method was adopted to allow the researcher to develop a holistic understanding of SNS use and well-being by obtaining complementary yet different data.

4.3 Research design

Understanding the role of SNS on user behaviour and well-being is multifaceted and complex, and the adoption of a holistic methodology can contribute to further understanding the influence of SNS on psychological well-being and user experience online. Quantitative studies into SNS use and well-being have suggested time spent on SNS influences the development of maladaptive cognitions and disorders (Baturay & Toker, 2016; Scott et al.,

2017). However, qualitative research argues motivations and gratifications can influence user behaviour online (Chua & Chang, 2016). In addition to this, research on SNS use is beginning to adopt the use of digital experience sampling method (ESM) measures, and behavioural tracking measures through smartphone applications to provide objective insight into SNS usage (e.g., Lin et al., 2017; Wilcockson et al., 2018). Whilst each of these methods have their own advantages and disadvantages, there still remains a paucity of holistic understanding in how users engage with SNS platforms online, beyond retrospective screen time measures, and which explore how user behaviour and attitudes can be influenced on platforms such as Instagram in both general and clinical populations. The present project holds that facets of social influence (e.g., internalisation, peer influence) and personal motivations and gratifications will influence user behaviours and attitudes online. In addition, it is also argued in the present project that the ways users engage with Instagram will affect their well-being outcomes in relation to anxiety, depression and body image.

4.4 Philosophical positions

4.4.1 Positivism

The positivist paradigm is grounded in the assumption that a single tangible reality exists (Park et al., 2019). From this perspective, positivism is based on a realism ontology in which positivists strive to understand the social world like the natural world, aiming to interpret phenomena in the context of facts and/or measurable entities (Rehamn & Alharthi, 2016; Konge & Artino, 2019). Moreover, this stance is epistemologically objective, whereby phenomena exist independently from any subjective consciousness of them (King & Horrocks, 2010; Rehamn & Alharthi, 2016). Thus, within research, separation must exist between the participant and the research to ensure that truth and reality of knowledge are captured accurately, without the values of the researcher or participants influencing its development (Park et al., 2019).

Accordingly, positivist research relies on deductive logic, aiming to generate explanatory associations or causal relationships based on measurable outcomes (Lamotta, 2017), advocating the use of quantitative data collection and analysis techniques. As such, generalizable inferences, replication of findings, and controlled experimentation are the underpinning principles guiding positivist research (Park et al., 2019). Ultimately, the findings from quantitative research are used to help inform theory and contribute to the literature. Within the present project, a positivist paradigm was employed in Stages 1, 2 and 3, where the quantitative element of Stage 1 employed objective screen time monitoring of Instagram, Stage 2 utilised a quantitative approach using an online questionnaire to investigate Instagram usage patterns alongside psychological well-being outcomes, and Stage 3 employed objective screen time, app launch and notification monitoring of Instagram. Thus, the data collected took a focus on the explanation and prediction of variables, operating objectively without the influence of the researcher to provide explanatory insight into the relationships between Instagram usage patterns and psychological well-being outcomes.

4.4.2 Interpretivism

One limitation of a positivist stance is that it dismisses the importance of individuals' experiences (Park & Artino, 2019). This can cause constraints in exploring the more abstract nature of the relationship between SNS and well-being. An interpretivist paradigm on the other hand, seeks to understand the subjective world of human experience, placing emphasis on understanding the individual and their interpretation of the world around them (Kivunja & Kuyini, 2017).

Interpretations of phenomena are considered as constructions, whereby participants bring their experiences as formed by their perspectives and beliefs that pertain to their situational circumstances, but also where the research is guided by the researcher's own beliefs and experiences into the interpretative process (Hiller, 2016). In this regard, interpretivism adopts

a relativist ontology, whereby knowledge is relative to contextual circumstances, and exists in multiple interpretations by individuals (Levers, 2013). Moreover, knowledge is intersubjective, and relative to the situations and people that it concerns (Hiller, 2016). Within research, an interpretivist approach utilises qualitative data, for example, interviews and focus groups, to explore these realities and the meanings made of them. Thus, the present project utilised two variants of interpretivism in light of the qualitative strands of the project, which are discussed below.

4.4.3 Social constructionism

Social constructionism can be traced to an interpretivist approach to thinking, wherein a general focus is employed on the process in which meanings are created (Andrews, 2012), and where knowledge is relative to an individual's location within a set of social norms (Cruickshank, 2012). Social constructionism takes a focus on the dynamics within social interactions between individuals, and how meanings are created through these interactions (Losantos et al., 2016). However, the primary role in the construction of knowledge within this approach stems from language and discourse, whereby knowledge is a product of interaction within the environment (Taylor, 2018). Thus, conversation is the most important means of maintaining, modifying and reconstructing subjective reality (Andrews, 2012). Indeed, it has been shown that social interactional domains from peers and the social environment can provide individuals a space to share and discuss issues and behaviours pertaining to body image and well-being (Kenny et al., 2016). Therefore, the interactional emphasis in the formation of knowledge was considered a suitable way to gain understanding of how Instagram users' attitudes around SNS, body image and well-being are constructed in response to other users, and thus was chosen to underpin the focus group analysis within Stage 1 of the present project.

4.4.4 Phenomenology

Phenomenology rejects the claim that it is not possible to go beyond cultural consciousness in our experience of the world, as advocated by interpretivism and constructionism. Rather phenomenology, as developed by Husserl (1931), aims to understand phenomena as they appear in individuals' conscious experience, taking a focus on the world as lived by a person and attempting to understand the meanings of human experiences as it is lived (Laverty, 2003). Moreover, phenomenology aims to recognise the components that make a given phenomenon unique by way of eidetic reduction (Pietkiewicz & Smith, 2014). Thus, research taking a phenomenological approach takes a focus on how individuals perceive and speak about objects and events (Pietkiewicz & Smith, 2014).

This stance was further developed by Heidegger (1962), who argued consciousness is not detached from the world, but rather a formation of historically lived experience (Laverty, 2003). In this regard, an individual's engagement with the world and their understanding of meanings can be accessed through an interpretative (hermeneutic) process which moves from parts of experience to the whole experience as a way to find intended or expressed meanings (Laverty, 2003).

Interpretative phenomenological analysis (IPA) draws upon the fundamental principles of phenomenology, hermeneutics and ideography to explore how individuals make sense of their experiences (Pietkiewicz & Smith, 2014), and was the methodological framework employed for Stages 4 and 5 of the present project. In IPA, the researcher attempts to make sense of the participant trying to make sense of their personal world, navigating through different layers of interpretation to engage deeply with a participant's personal experience (Eatough & Smith, 2017). This is done whilst suspending preconceptions and remaining open to individual accounts of lived experiences, with a particular focus on the meanings of these experiences (Rajasinghe, 2019). Not only this, but IPA maintains an idiographic

commitment, taking a focus on the particular and unique, rather than the universal, to maintain the integrity of the individual (Dimler et al., 2017; Eatough & Smith, 2017). Thus, within the present project, this was perceived a suitable framework to help illuminate the unique experiences of individuals living with BDD, and their experience of using SNS with the disorder, in addition to the experiences of clinicians working with BDD clients.

4.5 Epistemological position

A pragmatist worldview is often associated with mixed methods research as it allows for pluralistic methodology (Johnson & Onwuegbuzie 2004; Creswell & Plano Clark, 2011). As a research paradigm, a pragmatist approach gives less influence to philosophical assumptions, allowing the flexibility to draw freely from both quantitative and qualitative assumptions when they engage in research (Cresswell, 2013; Kaushik & Walsh, 2019). Unlike positivism, where knowledge is acquired through empirical evidence, and constructivism, which posits knowledge is relative (Kaushik & Walsh, 2019), pragmatism embraces a position where the acquisition of knowledge is situated within a continuum between positivistic and constructivist modes of enquiry (Johnson & Onwuegbuzie 2004). Doing so enables the researcher to select the research design and methodology most appropriate to address the research question(s), without the requirement that paradigmatic contradictions are resolved before different methods are combined in a study, enabling flexibility to choose various combinations of methods that are best suited to answer research questions (Johnson & Onwuegbuzie, 2004; Onwuegbuzie & Johnson, 2006). However, pragmatism is relativistic in the sense that it reserves judgement until findings may be compared, which may cause difficulties when evaluating research designs (Baškarada & Koronios, 2018). Moreover, pragmatism is compatible with explanatory rather than interpretivist research (Cronenberg, 2018). Within the present project, this incompatibility can make the study of the complexity of SNS and user behaviour difficult, as interpretivist insights are necessary to wholly

understand the different perspectives and nuances often present in this context (Cronenberg, 2018).

A dialectic stance on the other hand, goes beyond pragmatism in that the integration of methods does not only occur for additive understanding, but also for generating new insights. That is, the dialectic stance can provide new perspectives about the phenomenon being researched (Cronenberg, 2018). From this perspective, respective philosophical stances are recognised as different, and these differences create a dialogue which engages with multiple paradigms, concepts and methods (Johnson, 2011). In this way, both convergence and divergence are valued when mixing data from multiple methods, which can lead to greater insights into the complex aspects of a phenomenon, in turn providing the opportunity for unexplored aspects of the issue to come to light (Cronenberg, 2018). Thus, it is through this dialogue between perspectives that deeper understanding can be gained on complex phenomena, in addition to broadening the acceptance of complex issues within the phenomena that may arise (Johnson, 2011; Maxwell, 2011).

The purpose of this project was twofold: i) to investigate the role of SNS (in particular Instagram) usage patterns on psychological well-being outcomes and ii) to identify and understand the features of SNS (and Instagram) use that may influence well-being outcomes from the perspectives of Instagram users, individuals experiencing BDD and clinicians working in the field of BDD. A multistage mixed methods approach was used (Fetter et al., 2013), utilising qualitative, quantitative and objective data, and employing a dialectic stance, due to the value given between different perspectives to address the research questions fully. In line with the metaparadigm of the dialectical perspective, studies that are conducted with different philosophical stances each contribute towards partial knowledge on the broader issue, and integration can occur at different levels (Howes, 2015). As each stage in the present project contributed to knowledge of the broader research issue, the results of each

chapter were discussed within their respective discussion section, whilst the mixed methods results of Stage 1were integrated at an explanatory level within the discussion section of Chapter 5 (Howes, 2015). All results were then merged for interpretation within the General Discussion chapter of the present thesis.

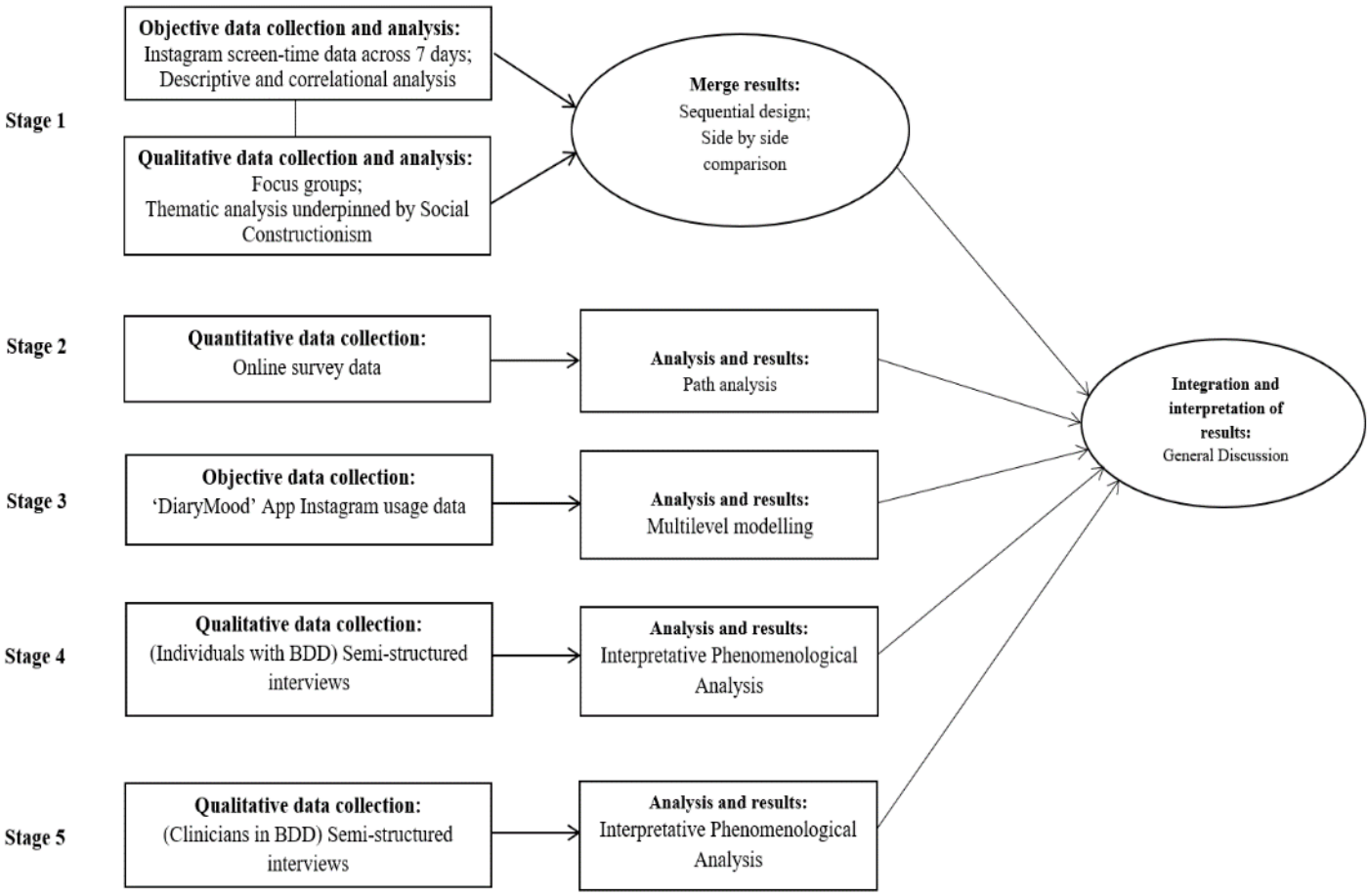
4.6 Multistage mixed method

A multistage mixed methods framework was adopted within the present project, whereby the researcher included both sequential (whereby quantitative data is collected first, followed by qualitative data collection before being analysed) and convergent (whereby data qualitative and quantitative data is collected and analysed within a similar timeframe) mixed method approaches within the project (Fetter et al., 2013). Stage 1 implemented a sequential design utilising focus groups and objective screen time monitoring of Instagram with a general population sample to explore how users spend their time online and identify the motivations and attitudes of using Instagram. Quantitative methods were utilised in Stage 2, using an online questionnaire to investigate Instagram usage patterns alongside psychological well-being outcomes. Stage 3 used objective monitoring, taking an objective monitoring approach to assess Instagram users' Instagram usage patterns and well-being across seven days. The quantitative strands of the project were utilised to help identify how different usage patterns may influence outcomes in body image satisfaction and well-being outcomes. Stages 4 and 5 explored the role of SNS within a clinical community of individuals who experience BDD, in addition to clinicians working in the field of BDD, respectively. It has been shown that there may be overlaps in the way SNS can influence individuals with body image dissatisfaction and those with a body image disorder (see Chapter 2 for detailed discussion). However, there has been limited research that specifically explores SNS use within a BDD population, and the potential influences that image-based platforms such as Instagram may have on BDD symptoms and the maintenance of maladaptive appearance cognitions (Ryding & Kuss,

2020). As such, the interviews conducted aimed to shed light on the experiences of using SNS whilst living with the disorder, as well as gaining insight into the role of SNS use on individuals with BDD from those working in the field of BDD. Data and results were reported within the discussion sections of the stages outlined, before being integrated within the general discussion section of the present project to explore the convergence and divergence of data between both general and clinical samples (Cresswell et al., 2011). Both qualitative and quantitative data were given equal weighting within the present project. An overview of the mixed method design is depicted in Figure 4.1.

Figure 4.1

Diagram of mixed methods project



PART IV: EMPIRICAL STUDIES

CHAPTER 5

A mixed methods exploration into the role of Instagram use on body image and well-being

The empirical study presented in this chapter explores the role of Instagram use on well-being and body image. A sequential mixed-method design was implemented to explore how users spend their time online and to identify the motivations and attitudes of using Instagram. The qualitative element of this study expanded upon the quantitative data captured, providing nuanced insight into the motivations and attitudes of users SNS use. The mixed-method design within this study formed the first stage of the multi-stage mixed method framework adopted for the present project. This study contributed to establishing how users construct their attitudes around Instagram, to better understand and identify the social impacts specific Instagram features may have on body image and well-being outcomes within a non-clinical population.

5.1 Introduction

Social networking sites (SNS) enable a number of affordances such as messaging, uploading images and filtering content (Kuss & Griffiths, 2011; Scott et al., 2017), and it has been demonstrated that SNS can provide benefits in contributing towards building social capital and maintaining relationships by providing greater access to individuals who are geographically separated (Wright, 2016). However, recent literature has also indicated several problems that can arise from SNS overuse, for instance the presentation of psychopathological symptoms such as anxiety and depression (Woods & Scott 2016; Kuss et al., 2018), in addition to increased body image dissatisfaction and related body image

disorders (Holland & Tiggemann, 2016). This suggests that differential outcomes of well-being may be attributed to the way users navigate and engage with SNS platforms.

Research has indicated a number of factors that may motivate SNS use. For instance, it has been demonstrated that communication and maintaining social relations motivate Facebook usage (Quan-Haase & Young, 2010), whilst information sharing and seeking public expression were the most predictive intentions for using Twitter (Liu et al., 2010). As such, a number of theories have been proposed to explain the motivations of using SNS. The uses and gratifications (U&G) theory is one prominent theory that has been used to evaluate an individual's motivations and gratifications for engaging with specific media (Katz et al., 1973). Whilst initially developed to understand why individuals use more traditional media (e.g., television), it has since been applied and extended to SNS use (Sheldon & Bryant, 2016). According to the U&G theory, users of media are motivated by both gratifications that are sought and obtained. The approach has five major assumptions: (i) users are active and goal-directed, (ii) people use media to gratify certain needs, (iii) the media compete with other need-satisfying sources, (iv) media users are aware of their interests and motives which help them with media selection and gratification and (v) value judgements of media content can only be assessed by the user (Katz et al., 1974; Alhabash & Ma, 2017). However, it has been argued that use is sometimes habitual, and users may not always be mindful of their SNS use (Rubin, 2002; Lee et al., 2017), whereby one's intention to use SNS may be due to a non-selective decision to use media for utilitarian and diversionary motivations (practical and distractive purposes, respectively) (Rubin, 2002; Ang et al., 2015), leading to alterations in everyday behaviours (Griffiths, 2018). Indeed, it has been found that Instagram users place more emphasis on self-promotion, surveillance and gathering knowledge about others as opposed to connecting with other people (Sheldon & Byant, 2016), indicating SNS-gratification dimensions for surveillance and behavioural-guidance. As such, this suggests

that differences in the functionalities available on each platform are likely to yield unique motivations and gratifications sought and obtained (Alhabash & Ma, 2017). Much research to date however has focused on Facebook use (e.g., Teppers et al., 2014; Manasijević et al., 2016; Mäntymäki & Islam, 2016), despite research indicating more than half of young adults (aged 18-29 years) use the photo-based platform Instagram (Stanley, 2015; Alhabash & Ma, 2017). Thus, given the flexibility of affordances available on different SNS, this highlights a need to consider the motivations of use on specific sites for different individuals (Alhabash & Ma, 2017).

Photo-based SNS in particular, such as Instagram, have become increasingly popular in teenagers and young adults (Alhabash & Ma, 2017; Jackson & Luchner, 2017). Such platforms provide affordances enabling the filtering and sharing of photos, in addition to story creations and live broadcasts (Kircaburun et al., 2018). However, a growing body of literature has begun to provide evidence of anxiety, depression, low self-esteem and body image dissatisfaction associated with the use of Instagram and SNS (Brown & Tiggemann, 2016; Valkenburg et al., 2017; Sherlock & Wagstaff, 2019). Research on body satisfaction in particular has drawn great interest in regard to Instagram due to its highly visual platform. As discussed in Chapter 2, Instagram provides an environment which can encourage gratifications regarding self-promotion and the presentation of a popular self and surveillance of others (Sheldon & Byant, 2016; Kircaburun et al., 2018), and levels of body image satisfaction may be attributed to the ways in which self-presentation and peer influence interact to co-construct standards of beauty on image-based platforms (Meier & Gray, 2014). Indeed, it has been demonstrated that appearance-based SNS use (e.g., scrolling photos emphasising physical appearance) is associated with increased body image dissatisfaction and body image-based disorders (Holland & Tiggemann, 2016; Ryding & Kuss, 2020; see

Chapter 2 for detailed discussion), particularly when viewing ‘fitspiration’ images, or images portraying an ideal appearance (Prichard et al., 2020; Cohen et al., 2017).

Specifically, comparisons to others may lead to increased body dissatisfaction, especially when the comparisons are upward in nature (where comparisons are made to others perceived as holding superior characteristics) (Festinger, 1954; Kim & Chock, 2015). It has been shown that female users are likely to be motivated to compare themselves on SNS to adapt and develop their own self-presentation and self-image (Haferkamp et al., 2012), and it is likely that upward comparisons are more likely to occur since SNS users are often confronted with the successes of their online connections as opposed to the failures (Verduyn et al., 2020). SNS platforms also tend to exhibit idealised and altered images by users who upload them (Tiggemann & Zaccardo, 2015), which suggests that an image-based platform may be more likely to lead to adverse effects on well-being for users viewing content, especially in the context of self-presentational motives (Verduyn et al., 2020). However, research has argued that SNS sites can also provide social support for different social groups (Cannon et al., 2017), as well as increased awareness and information for stigmatised topics and disorders for those who may not receive adequate support from more traditional face to face sources (Han et al., 2018). In addition, it has been found that individuals with mental illnesses may turn to SNS to share experiences and seek information for support and treatment options (Naslund et al., 2020), indicating a benefit for SNS in supporting well-being for users. Such research has explored SNS generally; however, there is little research exploring specific platforms or the potential influences image-based platforms such as Instagram may have on well-being. This highlights a need in understanding how users engage with image based SNS and the influence that viewing different types of content may have on well-being and body image outcomes.

The interactivity of social media may also play a role in the influence of well-being and body image outcomes in users. According to the tripartite influence model of body image disturbance, there are three primary influences that contribute to the development of body image satisfaction: peers, parents and media influence (van den Berg et al., 2002). In particular, it is posited that perceived appearance pressures from these three influences can lead to body dissatisfaction through both direct and indirect comments and messages, through praise and promotion of body ideals (Huxley et al., 2014). Additionally, it is theorised that this relationship is mediated by the internalisation of body ideal and appearance comparison (Thompson et al., 1999; Kenny et al., 2016). While peers are recognised within this model, there is limited qualitative research that focuses on peer influences and body image satisfaction. That is, interactive features such as likes and comments (Frison & Eggermont, 2017), may provide a new medium of peer feedback that has the potential to shape SNS users' views of their bodies.

It has been suggested that feedback in the form of likes can be a marker of popularity and peer status, which may in turn reinforce particular attitudes and behaviours (Tiggemann et al., 2018). For instance, it has been demonstrated that young adults engage in a variety of behaviours to gain both attention and approval that are measured in the form of likes on Instagram (Dumas et al., 2017). Specifically, like-seeking behaviours (such as buying likes, i.e., purchasing fake likes to increase visibility on a platform) for validation and attention may be related to lower well-being outcomes such as lower self-esteem (Dumas et al., 2017). Furthermore, initial qualitative research that has focussed on Instagram behaviour, has indicated likes as a measure and form of peer approval of physical beauty in teenage girls, with self-presentational behaviours and comparisons driving the desire for validation and attention, ultimately leading to problems with low self-esteem and insecurity (Chua & Chang, 2016). However, this primary qualitative research has focussed on teenage girls under the age

of 18 years. As of 2021, it has been shown that the main users of Instagram, Snapchat and TikTok are between the ages of 18-29 years old (Auxer & Anderson, 2021). Yet, there still remains a paucity of research exploring the interactive features of SNS in the context of well-being and body image in this age group. It has been found that young adults between the ages of 18-29 present significantly lower social well-being, particularly if social acceptance is perceived to be low (Bekalu et al., 2019), which may motivate users of this age to engage in behaviours, such as like seeking on a photo on SNS, to gain approval and attention to increase feelings of social acceptance, indicating a further need to identify and explore the motivations surrounding SNS engagement, well-being and body image outcomes in young adults.

Whilst a growing body of literature is beginning to uncover the potential influences SNS may have on well-being, much research remains based on self-report methods, which may not capture the underlying motivations and behaviours of SNS users wholly. In particular, when investigating the association of SNS on well-being, many studies rely on retrospective self-report measures of screen time of SNS (e.g., Hanna et al., 2017; Fardouly et al., 2018; Marengo et al. 2018). It has been shown that individuals are poor at estimating SNS usage durations, thus self-report measures that are used in estimating one's SNS use may not reflect objectively measured SNS use (Ellis, 2019). Passive objective monitoring however, whereby data is collected unobtrusively can allow for SNS patterns such as screen time and social media activity to be collected (Asselbergs et al., 2016). This can allow for a more accurate assessment of data, and can be beneficial in investigating behavioural patterns across a period of time (Asselbergs et al., 2016; Bentley et al., 2018).

Qualitative approaches can uncover why and how individuals interact and engage with social phenomena like SNS, as well as exploring how knowledge and meanings are attached to experiences with SNS (Snelson, 2016). For instance, qualitative research exploring attitudes

around SNS and SNS use, found motives of using SNS include emotion regulation, peer enhancement, ego validation and self-enhancement (Throuvala et al., 2019), which led adolescents to report SNS as offering both positive and negative experiences from usage. However, this study accounted for different SNS platforms, and therefore there may be nuances in platform-specific features that may provide different attitudes towards how users experience the platform. Given this, research is needed to gain understanding into how users construct their attitudes around Instagram, to better understand and identify the social impacts specific Instagram features may have on body image and well-being outcomes.

In light of this, a mixed-method approach will be utilised in the present study to gain a holistic insight into Instagram user behaviour and attitudes around Instagram and well-being. Specifically, the present study aims to investigate the relationship between Instagram usage and age using objective monitoring, to explore whether there are any differences in Instagram usage between users over the age of 18. It is hypothesised that as age increases, users will spend less time on Instagram across a seven-day period, as it has been shown that older users are more likely to value offline communication and social relationships, in addition to being more wary about privacy on SNS (Chang et al., 2015; Jung et al., 2017). In addition, this study aims to explore the role of SNS use in body image and well-being with a particular focus on the platform Instagram, whilst also seeking to identify the specific features of Instagram that may impact body image and well-being. The present study was conducted with a non-clinical population, to establish the role of Instagram use on body image and well-being in users without potential influence of intrinsic motivations of usage, which may be expressed by those in a clinical population (e.g., BDD; further discussed in Chapter 8). By integrating a quantitative element alongside qualitative data, this can shed light in elaborating and explaining specific features and motivations users may have in using SNS, providing the

ability to explore and produce knowledge to address the gap in literature surrounding the interaction with image based SNS, well-being and motivations in adults.

5.2 Method

5.2.1 Design

This study implemented a sequential mixed methods design (Creswell & Plano Clarke, 2011) for data collection, whereby an objective measure of Instagram screen time was collected through the 'screen time' feature, followed by focus groups to further explore the attitudes and behaviours associated with Instagram use. Whilst objective data is beneficial in capturing the objective behaviour of the user, the qualitative element of this study can further explore how the motivations and attitudes of user's SNS use are constructed and the influence these may have on well-being and body image. The qualitative and quantitative components of this study were collected and analysed independently of each other, as the qualitative strand of the study was not dependent on the results of the objective strand of the study (Schoonenboom & Johnson, 2017). The results of each component were subsequently brought together in the discussion of this study.

5.2.2 Participants

Participants were recruited from Nottingham Trent University on a voluntary basis, both online (via Twitter, Facebook, Instagram and an online student recruitment portal) and offline (via posters in university communal areas). Eligibility criteria included being (i) at least 18 years of age, (ii) able to understand the instructions implemented within the study and provide informed consent, (iii) users of SNS platform Instagram and (iv) use a smartphone with screen time tracking enabled. Participants were put into a draw for a £50 Amazon voucher or accredited with 8 SONA credits (if a psychology student at the university) as

compensation for their time. Participants took part in both the quantitative and qualitative strands of this study.

A total of 30 participants were recruited for the study. All 30 participants took part in the focus group element of the study. Participants were aged between 18-32 (*M*=23.17, *SD*=3.09) and consisted of 19 women and 11 men. In terms of ethnicity, 63.3% of participants were of white ethnicity, 16.6% were Asian, 10% were Black or African American, 3.3% were Spanish and 6.6% were of other ethnic backgrounds. The majority of participants were students, including undergraduate (50%) and PhD students (23.3%), with 16.6% and 10% of participants being in full-time and part-time employment, respectively.

A total of 27 out of the initial 30 participants took part in the objective monitoring side of the study (age 18-32, *M*=23.41, *SD*=3.08). One male and one female participant were excluded from this part of the study as they were unable to provide Instagram screen time metrics due to deleting the application. Another female participant was excluded as she volunteered to take part in the focus group element but requested not to partake in the objective monitoring element of the study. Due to their experience and knowledge of using Instagram however, the three participants who were excluded from the objective monitoring strand of data collection were included in the focus group discussions.

5.2.3 Procedure and materials

5.2.3.1 Demographics

Information about age, gender, ethnicity, and occupation were collected.

5.2.3.2 Objective measure

The sample included both Apple and Android users. The ‘Screen Time’ feature on Apple iOS was used to collect Instagram usage data from Apple users. For Android users, the ‘Your Activity’ feature of Instagram was used to collect Instagram usage data. Both features log the

daily screen time in hours and minutes the user is on Instagram when the screen is active and unlocked.

Prior to taking part in the focus groups, participants took screenshots to capture the actual number of hours and minutes they had spent on Instagram from the past seven days. Weekly averages were calculated for each participant once their behavioural metrics had been collected.

5.2.3.3 Focus groups

Focus groups were conducted to gain understanding of participant experiences, attitudes and beliefs regarding SNS engagement and well-being (Hammarberg et al., 2016). Focus groups were chosen as they provide the ability for participants to structure and describe their experiences and perceptions around the shared phenomenon of SNS usage and engagement (Smithson, 2007). A semi-structured schedule was developed in accordance with the focus group question design protocol described by Krueger and Casey (2015). The focus group questions explored facets of SNS platforms generally, and aspects of Instagram and well-being. All main questions had associated follow-up questions to prompt a more detailed response. For example, the question "What is it about social networking sites that motivates or influences you to use them?" contained the follow up question "In regard to Instagram, are there any particular aspects of the platform that you feel motivates you to use it?". In this case, this associated question was meant to encourage discussion about any features of Instagram that may encourage usage of the platform.

In this study, focus groups were homogeneous, consisting of similar ages and participants of the same gender. Homogenous groups were created to facilitate rapport within groups. Three focus groups were initially conducted face to face, but five focus groups were transferred online as a result of the COVID-19 outbreak. A synchronous approach was taken for the

online focus groups, whereby participants were involved in a real-time discussion at the same time (Stewart & Shamdasani, 2016). This approach was chosen over an asynchronous method due to the ability to be involved in a live, real-time discussion (Stewart & Shamdasani, 2016), which can contribute towards facilitating dynamic group interaction and exchanges that are comparable to the conversational interactions elicited in face-to-face groups (Fox et al., 2007; Moore et al., 2015). As face-to-face focus groups had already been conducted for this research, a synchronous online approach was therefore considered most appropriate in yielding similar forms of collaborative knowledge (Moore et al., 2015).

5.2.4 Focus Group Procedures

Eight focus groups were conducted in total. Due to the sensitive nature of body image discussions, it was anticipated that males and females would be more comfortable and open to discussing body image satisfaction within groups of their own gender (Yager et al., 2013) and therefore single gender groups were chosen to form the focus groups.

Three focus groups were conducted in person consisting of two female groups (each group *n=4)* and one male group (*n=4).* Five focus groups were conducted online consisting of three female groups (group one *n*=4; group two *n*=3; group 3 *n*=4) and two male groups (group 1 *n*=4; group 2 *n*=3). Each session lasted an average of 110 minutes (ranging from 100-135 minutes) with the online groups lasting longer on average (*M*= 177 minutes) than the offline groups (*M*=97 minutes).

5.2.4.1 Face to face focus groups

Three focus groups were held in university rooms that enabled participants to sit facing one another around a table. All focus groups were recorded using Dictaphones. Focus groups were scheduled for two hours, using a semi-structured focus group schedule to facilitate discussion (Appendix III). The schedule began with a short ice breaker task for participants to

introduce themselves to the other members in the group. Following this, participants were encouraged to discuss their perceptions and experiences of SNS platforms and well-being. Photographs portraying SNS influencers and images of 'normal' people (individuals not endorsing a product or specialising in content in a niche area, e.g., fitness) were also implemented during focus groups to help facilitate discussions. These images were used to observe participants' understandings and interactions within the social situation (Richard & Lahman, 2014). All participants were debriefed following the focus groups.

5.2.4.2 Online focus groups

Five focus groups were conducted employing a synchronous text-based approach online, using an instant messaging platform. It has been highlighted that synchronous text-based focus groups in research can be beneficial for engaging individuals who are already familiar with instant messaging (Fox et al., 2007). In addition, although communication is written, the linguistic features of text often mirror the spoken word, aiding in interpretation of group dynamics and meanings within qualitative research (Stewart & Williams, 2005), thus synchronous text-based focus groups were considered a suitable approach to utilise within the present study. As with the face-to-face focus groups, the online focus groups were scheduled for two hours, following the same semi-structured schedule. The platform used also enabled the sharing of the prompt images chosen to help aid the conversation. Additionally, to help moderate the discussion, the platform enabled the moderator to see when participants were typing. This text-based method was chosen as instant messaging is often integrated within SNS platforms; therefore, it was considered a familiar method of conversing for participants. All participants were debriefed following the focus groups.

5.5 Analyses and results

Within the present study, both the objective and qualitative strands of data were analysed separately. This is in line with the core characteristics of mixed methods research, as outlined by Creswell & Plano Clark (2011), whereby consideration should be given to each form of data collection to address each research question (Ivankova et al., 2006). The goal of the objective data was to identify the relationship between age and Instagram usage. Following this, the focus group data was collected and analysed to explore how users engage with Instagram. Thus, the objective data provided a general understanding of time spent using Instagram across age, whilst the qualitative data provided explanation into how and why users use and engage with Instagram. The results of both the objective and qualitative phases were then integrated during the discussion of the outcomes of the study, to develop a holistic and meaningful picture of Instagram engagement in adults (Ivankva et al., 2006).

5.5.1 Quantitative analysis and results

To establish the number of hours and minutes spent on Instagram, the weekly average was calculated for each participant. Following this, a Pearson's correlation was conducted to determine the relationship between Instagram screen time use and age.

5.5.1.1 Descriptive statistics

Means, standard deviations and correlations were calculated to identify average Instagram screen time usage across seven days. Participants had a weekly average of 46 minutes on Instagram. Female users had a higher weekly average (52 minutes) than male users (36 minutes). A total of 26% of users averaged an hour or more using Instagram, with the highest screen time use being an average of 2 hours 21minutes. Means and standard deviations are shown in Table 5.1.

Table 5.1

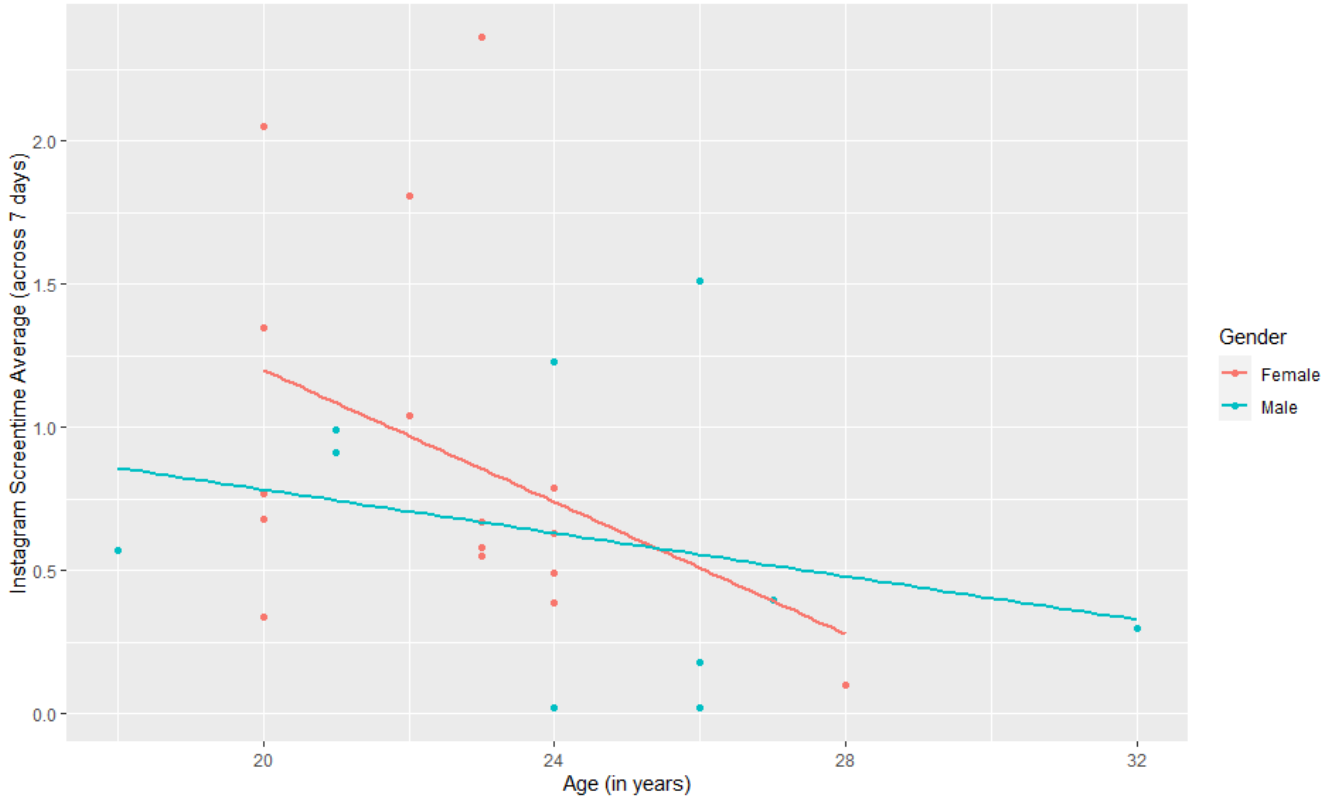
Means and standard deviations of Instagram screen time across one week

Gender	**Mean (SD) Instagram use** (in decimal minutes)
Total	46.00 (0.60)
Female	52.00 (0.64)
Male	36.00 (0.52)

The relationship between age and Instagram screen time use was assessed using Pearson's correlation. There was a weak negative correlation between the two variables (r=-.38, p <0.05), indicating a negative association between age and Instagram screen time. Figure 5.1. depicts the relationship between age and average Instagram use (across seven days) of male and female participants.

Figure 5.1

The relationship between age and average Instagram use in decimal minutes (across seven days) of male and female participants



5.5.2 Qualitative analysis

Focus groups were analysed using thematic analysis (TA; Braun & Clarke, 2006) underpinned by the theoretical framework of social constructionism (Burr, 2015). The theory of social constructionism is based on a relativist epistemology, which posits that knowledge is relative to one's location within a set of social norms (Potter, 2003; Cruickshank, 2012). Knowledge is attained from viewing the world from one perspective or another, with emphasis being placed on the meanings social actors confer on their experiences and

interactions between individuals (Weinberg, 2014; Burr, 2015; Losantos et al., 2016). In this way, social constructionism views reality as a socially defined and subjective experience of everyday life (Andrews, 2012).

Within a social constructionist approach there is a focus on the process of construction and how meanings are created through the dynamics within social interactions between individuals (Losantos et al, 2016), whereby knowledge changes over time as constructed by people, their context and culture (Burr, 2015). In particular, the concept of all-knowledge, including common sense knowledge of everyday reality, is derived from, and maintained by social interactions (Berger & Luckmann, 1967). From this perspective, society combines both subjective and objective realities, whereby subjective meanings become objective facilities through regularity and routines in society. Therefore, routine action develops as general knowledge and becomes objective once it is established within society, becoming integrated into different social situations (Berger & Luckmann, 1967; Andrews, 2012). Thus, the primary role in the construction of knowledge is derived through language and discourse, whereby knowledge is a product of human interaction within the environment (Taylor, 2018).

In the present study, social constructionism was chosen due to its interactional emphasis in the formation of knowledge (Burr, 2015). The SNS environment is a predominantly social space, whereby interactions with content and others online can contribute towards the construction of perceived body image ideals, and attitudes around the ways other users are viewed to interact and engage with Instagram. Given that users are exposed to different realities on SNS, knowledge is likely to present different meanings aligned with participant experiences of SNS use. Indeed, it has been shown that social interactional domains from peers and the social environment can influence the construct of body image, by providing individuals a space to share, discuss and criticise appearance-related behaviours and issues (Kenny et al., 2017). As such, this theoretical underpinning was suitable to observe the ways

in which focus group members interacted with one another, to gain understanding of how attitudes around SNS, body image and well-being are constructed in response to other Instagram users' perspectives.

Focus groups were analysed according to the stages defined by Braun and Clarke (2006). Familiarisation with the transcripts through reading and listening to each focus group encompassed the first stage. Initial codes were then developed in accordance with interesting features derived from social constructions within the transcripts. The software package NVivo 12 was used to facilitate the coding process. Codes and themes that reflected similar ideas and concepts were collated separately and combined into preliminary themes, which were inductively developed for each individual focus group transcript. These preliminary themes and codes were then reviewed across all transcripts. Codes and themes that reflected similar concepts across all focus groups were refined and developed inductively in an iterative process, before being consolidated into three main themes and eight subthemes.

Whilst both online and offline focus groups were synchronous in nature, the mode in which they were conducted (i.e., live verbal discussion vs. live text-based discussion) may impact the interactional dynamic and collaborative knowledge attained within the exchanges between participants (Murgado-Armenteros et al., 2012). Within this study however, there seemed to be no observable differences in levels of contribution between participants, and interpersonal exchanges between participants did not seem diminished by the digital environment (Stewart & Williams, 2005). Because of this, both online and offline focus groups were analysed together.

5.6 Findings from the thematic analysis

All participants revealed SNS as being integrated in their daily lives. Common patterns across the datasets were organised around central concepts, which were developed into the themes within the present study (see Appendix IV for audit of theme development). Subthemes that encompassed more specific topics were grouped under the general main themes. Three main themes were developed during analysis, which encompassed the influence of Instagram engagement on body image and well-being. These themes are presented with subthemes that represent knowledge which arose from interactions between participants. More specifically, *Staying cautious on SNS* revealed how participants viewed managing the impact of SNS on well-being, whilst *Comparisons to others: The highlight reel of Instagram* drew upon the perception of influencers on appearance expectations. Participants also positioned their understandings of SNS user presentations in 'Fake it till you make it: *Seeking validation and social acceptance*. Table 5.2 provides a summary of the themes and subthemes.

Table 5.2

Focus group themes and subthemes

Theme	Subtheme
Staying cautious on SNS	Agency in well-being
	Developing caution
Comparisons to others: The highlight reel of Instagram	Wanting to achieve unrealistic ideals
	Distinguishing what is real and not real
	Balancing envy and motivation
'Fake it till you make it': Seeking validation and social acceptance	Enhancing self on Instagram
	The 'social currency' of likes
	Navigating opinions, conflict and criticism

5.6.1 Staying cautious on SNS

Many participants described feelings of anxiety and foreboding towards SNS, drawing upon news media and interpersonal discussions with family members that surrounded SNS as having an influence in the way they used SNS platforms. Participants perceived both negative news that was reported in the media, in addition to warnings from family members, as informing them to become increasingly cautious of the amount of time spent on SNS platforms and the type of content that they followed and engaged with. Yet, participants also illustrated a number of benefits afforded through SNS platforms, eliciting descriptions of SNS engagement as a double-edged sword. Many participants described having an awareness of both the negative and positive sides of SNS as being influential in their use of SNS sites, and as a result, suggested that users remain cautious of their SNS usage in light of this two-sided nature of SNS. This is further explored in the subthemes *Agency in well-being* and *Developing caution.*

5.6.1.1 Agency in well-being

Participants framed users who were able to limit their time spent on Instagram, or follow more positive content (e.g., cute animals; content surrounding hobbies and interests) as being able to control their SNS content. Participants who curated their following on Instagram, by following accounts framed as containing positive content, described their perception of negative impacts as being formed through news reports and discussions with friends and family. For instance, one participant in focus group one referred to their knowledge of SNS as being framed around the portrayal of SNS within articles and interactions with their mother. Within these discussions, participants described SNS use as being demonised, whereby interactions with others were framed to highlight the negative aspects of SNS use, and family members would suggest limiting SNS engagement as a result of seeing these negative reports.

Participant 4, Age 27*: "It's a big part of my life because I know people (…) and all they talk about is social media, so when I log onto my social media all I ever see is articles about how social media is bad"*

MOD*: "Okay, so when you say you hear about bad things, could you explain a bit more about that?"*

Participant 4: *"Yeah so my mum sent me an article yesterday morning or the morning before being like um kids are using too much social media and they get anxious when they're not using social media or something like that (…) people are always just talking about it, it's just a part of the daily discussions that I have"* ***Focus Group 1 Offline Female***

More specifically, focus groups referred to SNS as exacerbating poor well-being of individuals (e.g., anxiety, low body image satisfaction, discussed further in the theme *'Fake it till you make it': Seeking validation and social acceptance*). Some participants described feelings of stress and anxiety in the context of discussing posting content and the expectation for likes once a photo was posted. Within other groups, participants positioned impacts on well-being as a slow process, describing SNS as 'eroding' well-being, creating the impression of SNS impacting well-being over time. As a result of these wider social interactions through the media and discussions with family and peers, most participants revealed that they would try to limit time spent on SNS platforms and controlled content they viewed on SNS platforms as a way to mitigate potential negative impacts of SNS. This gave the impression that users' behaviours on SNS are shaped by wider social and media influences. However, two participants in focus group three, suggested that simply curating content and followers does not work to protect well-being, and referred to negative outcomes in the form of stress and anxiety from posting or receiving negative messages. In these discussions, participants

proposed removing the application from their smartphone as a way to completely withdraw from the platform and its impacts.

Participant 1, Age 22: *"I deleted [Instagram] I did realise it was like taking over my life a little bit, but it was less about that and it was more about the fact that I noticed it was having a negative impact on my mental health like I could tell (…) it wasn't like positive? And you know that that stuff isn't real and that what people post on Instagram isn't the whole picture but it was still (.) constantly triggering the need for me to like compete with that or post my own pictures and I just realised it was probably like just better off for me to not have it altogether"* ***Focus Group 3 Offline Female***

Participants framed curating content as selecting accounts that provided positive content on users' newsfeeds. When describing the process of curating content, participants used SNS as a natural and integrated behaviour within their daily routines. Participants described users as having an innate-like awareness of their mood whilst online, whereby individuals were expected to take steps to reduce any negative moods they may have when using SNS. For example, in focus group four, participants described consistent exposure to content of people that were considered attractive and portrayed rich lifestyles as creating negative impacts in well-being in regard to confidence and self-esteem. However, all participants agreed that SNS enabled freedom of expression and communication with others, whereby the open medium of SNS was perceived to provide a space for enhancing creativity (e.g., for photography), expressing thoughts and opinions about world events, and enabling to connect to like-minded people globally. Moreover, discussions between participants positioned the communicative aspect of SNS as being beneficial to well-being in giving the potential to reach out to others who were also in the same positions (e.g., suffering with anxiety, depression or body image dissatisfaction), framing Instagram as being beneficial for remote well-being support. Thus,

all focus groups concluded that when curating content followed on SNS, it was important for users to establish and follow accounts that were associated with positive mood.

Participant 3, Age 24 *"If someone follows a lot of content that is making them feel down i.e., people with money, people portraying better lifestyles etc. then this may have a negative impact on their well-being, but if they keep viewing this everyday then nothing is going to change. They should either come off of social media or follow different accounts that do not make them feel like they are not as good as the person in the posts. Everyone is in control of the people/things that they are following so they need to change their feed if they are feeling down about what they are viewing."* ***Focus Group 4 Online Female***

The amount of control participants had in curating their newsfeed was described as dependent on the SNS platform used. In particular, the Instagram explore page was framed as a space whereby unwanted content had the potential to be suggested or displayed to the user. Specifically, the explore page was portrayed as a negative Instagram feature within discussions, as content presented within the explore page was illustrated by participants as mainly being body image-based content, depicting both images and videos that targeted exercise, fat loss and building muscle, which was considered as having the potential to be impactful to self-esteem. Similarly, participants drew upon targeted adverts on SNS (e.g., 'fit-teas'), that were marketed towards weight loss as often appearing on their explore page or newsfeed, and their inability to avoid them. This created the impression that users do not always have control of content that is displayed on their newsfeed. In light of this, focus group discussions framed SNS users as having agency over their interactions with their personal newsfeed and whom they follow, suggesting that it was the responsibility of the user to interact with the content in a way that would benefit users' well-being. However, discussions also illustrated a paradoxical position of users when using SNS, whereby participants diminished their own responsibility of their active engagement and ability to

curate settings on Instagram, and instead blamed the platform for showing users content that they did not actively search for.

Participant 2, Age 20: *"I also think it depends on what you come across, one person may have on their timeline positive quotes that make them feel good about their day but someone else may have on their timeline pictures of celebrities with amazing bodies that cause them to compare themselves… Perhaps it's down to how you interact with content but what you see most of the time depends on what the apps let you see."* ***Focus Group 8 Offline Female***

6.6.1.2 Developing caution

Participants suggested that growing older changed the way they engaged with SNS platforms. Participants referred to their SNS use when they were between sixteen and twenty-one years old as more active, engaging with content by frequently posting images and including hashtags. They also framed this type of activity as a way to gain interaction from others. However, during these discussions, participants directed the conversation by describing a shift in their individual motivations to use SNS, the longer the platform was used. This shift was attributed to changing interests as they grew older, in addition to suggesting that users have an increased awareness of the negative impacts of SNS use, whereby they were more conscious of the content they interacted with as they grew older. For example, within one male group, one participant revealed changes in SNS use as being associated with the realisation that his profile and content followed was for his personal interests as opposed to using SNS as a social avenue. As a result, this led participants to illustrate a discovery-like process of using SNS, whereby the ability to engage with different content online over time was considered beneficial for Instagram users in forming opinions about profiles which suited their interests.

Participant 1, Age 32: *"I mean for me, my use really started to drop because I don't, I don't see the point of this anymore like, ooo! What's he posting, what's he putting up? And I'm like eh, no one cares if someone cares they'll ask and now if I want to put anything up I've got my album on my phone, with all my stuff on it, that's the stuff I want (.) you know at the end of the day, I kind of more (.) shifted to the realisation that Instagram profile, Facebook profile was more for me, more so than anyone else (…) Yeah so I think for me that's why my use has dropped off so much more and moved towards news and keeping up to date with gaming companies, video game related news, and things that I'm more interested in and why I've moved it I guess from the more social aspect"*

Participant 3, Age 26: *"Yeah so a lot of mine's is quite similar to yours in the respect that it's dropped off recently, just because it's easier to identify the negative side to it now because more people are aware of it (..) I used to post loads, but like you were saying, can't be bothered really (.) I have Facebook (…) it's more of like a formality so if people want to contact me, they can and I don't use it, I think the last time I posted on Facebook were like 2014 (..) I use Instagram more"* ***Focus Group 2 Offline Male***

Participants framed the ability to screen-shot content and being able to see users' locations as invading privacy. For example, one participant in focus group three revealed that screenshots of images were taken by other users from their SNS profiles and used to create dating profiles. Specifically, it was illustrated that these images drew the attention from friends of friends who notified the participant about their unsolicited use. The wider reach of the participant's photos in this context encouraged other participants within the group (FG3 F) to draw upon and discuss privacy features on SNS that users should be cautious about to prevent unwanted interactions from other users. Conversely, during this discussion, one participant revealed keeping their profile on public as a way to gain likes, despite receiving unwanted

interactions from strangers online. Instead, they discussed monitoring their profile privacy through actively opposing unwanted interactions by blocking or un-following specific users, as opposed to implementing a blanket privacy feature (e.g., making account private) as other members of the group referred to and suggested. During this interaction however, the discussion of extreme examples of blackmail on SNS by other members of the group seemingly lead this one participant to change her position on her privacy settings in response and consider moving to a private profile to prevent strangers accessing her content. Similarly, other focus group discussions around this topic elicited participants to recommend to each other the changing of privacy and location settings on SNS platforms, in addition to changing their accounts to private as a way to mitigate unwanted interaction from other users. As a result, it was illustrated that participants drew upon each other's opinions within groups, as well as to discussions with friends and family to help inform and develop their SNS engagement.

Participant 3, Age 20: *"Somebody was literally like blackmailing me while on social media, because of, it's a very stupid reason so I removed all my pictures on Instagram, I do not even have like a display picture on now, it's just a blank thing that I'm doing right now, no picture on Instagram, and also I do not follow anybody or I don't care who follows me, it's just people whom I'm already knowing or in touch with at the uni I'm following, and that's it"*

Participant 1, Age 22: *"I've also had like pictures that were on Facebook and Instagram of me like screen-shotted or taken by other people and then used to create like fake dating sites and then the only reason I would find out about them was because friends of friends would send them to my actual close friends who'd send them to me and I'd have to report them and it made me really mistrusting of putting pictures of me out there"*

Participant 2, Age 22: *"If I find if someone's like followed me who I don't know or looks a bit creepy, I always block them even though my account's on public anyway or if some*

random person who I don't know has again like liked my photos from ages ago as well I then find myself blocking them too (.) yeah so I suppose I still kind of want that (.) privacy sort of thing, or not want strangers looking at my photos but yeah I should really take my account off public" ***Focus Group 3 Offline Female***

Overall, within this theme, it was revealed that agency and awareness were social expectations attained from media stories and personal interactions with others, whereby SNS use was often demonised, and caution was expressed from different sources. As a result, developing caution was derived from these expectations of user attentiveness, giving the impression that it is the users' responsibility to mitigate the negative impacts that SNS platforms may have on well-being.

5.6.2 Comparisons to others: The highlight reel of Instagram

Images portraying others' lifestyles elicited social comparisons. Participants framed much of the content from other users as a 'highlight reel', whereby other users were described as posting and presenting the best parts of their lives, but not their struggles or challenges.

This window into others' lives was framed as being detrimental to Instagram viewer's well-being, with participants creating a sense of worthlessness against others online who presented idealistic lifestyles to participants. For participants, these surrounded two ideals: a toned or muscular body shape in regard to body image, and content that depicted capitalist aspirations through social and lavish lifestyles (e.g., expensive cars, frequent holidays). In particular, influencers and fitness trainers on Instagram were framed as having the content users were most likely to compare themselves to due to the portrayal of idealistic body image and associated lifestyles. When asked about engaging in comparisons on SNS, many participants described feelings of guilt and worthlessness when viewing fitness and influencer-related images as these were perceived to be unrealistic, unrelatable, and unobtainable. These

feelings and comparison processes are further explored in the subthemes *(i) Wanting to achieve unrealistic ideals, (ii) Distinguishing what is real and not real* and *(iii) Balancing envy and motivation.*

5.6.2.1 Wanting to achieve unrealistic ideals

Participants spoke from different positions when discussing how body ideals were presented online. When presented with Instagram images of fitness models and 'normal' users, participants drew upon their experiences of seeing images like these during their own Instagram use. For example, in one male group, one participant revealed potentially having a different opinion towards what was considered ideal in the images due to their sexual orientation, which carried the discussion further as the other participants in the group reflected upon the body features presented in the image of discussion. Specifically, another participant considered this statement in regard to a 'normal' user, responding by stating they had never seen 'a fat kid with stretch marks' on Instagram. This led the group to unanimously agree that attractive and 'ideal' features in regard to male Instagram models surrounded body shape (e.g., muscularity) and facial features (e.g., defined jawline); features that 'normal people' were considered as less likely to have. On the other hand, a female group developed their idea of ideal features after one participant expressed feelings of guilt when discussing abs shown on a female fitness model image. This statement drove participants to consider how users may feel unrepresented by influencer images and drew upon features such as clear skin, nice hair, and toned body shapes as being presented as the ideal on Instagram. As a result, the consensus from all participants regarding body ideals presented online gave the impression that physical body image features were the main elements that users look at on Instagram to gauge attractiveness and appearance ideals.

Participant 1, Age 32: *"Because I'm attracted to men, I might have a different reaction to you guys because there's a different (.) there's subtly different things going on I think in me, and how I compare (.) to how (.) you guys would all compare and relate to them"*

Participant 3, Age 26: *"((in overlap)) yeah"*

Participant 2, Age 24: *"Um (.) yeah"*

Participant 3*: "I agree with it, I agree with you on this one to be honest, urm this guy for me, is every guy that posts on Instagram, they're all like this you know, you don't ever see a fat kid with stretch marks you know so this is every dude on Instagram (.) he's every guy on the inspirational posts"* ***Focus Group 2 Offline Male***

When discussing lifestyle aspirations, participants described assessing ideal features in relation to their own lifestyles, drawing upon the discrepancies between themselves and the content viewed, and positioning themselves as different and less well off than users who portrayed ideal content. In particular, when discussing viewing fitness content, many participants described feelings of guilt due to the portrayal of toned body shapes. For a number of participants, this was referred to as motivational, and was suggested as a way to encourage users to go to the gym and eat healthier as a way to achieve a fitter figure. However other participants also reflected on how users may react when expectations of achieving the desired outcome could not be met, resulting in descriptions of discouragement, cynicism, and worthlessness in the ability to meet fitness goals. In contrast however, one participant described feeling less compelled to compare themselves to influencer images as they were 'too unrealistic', but instead expressed that peers were more relatable, and thus more appropriate for comparisons. In particular, participants also distanced themselves in terms of wealth, framing users that presented ideal content as being richer and from particular locations, suggesting that some users may not compare their own socioeconomic status to

others that are identified as less like themselves. Nevertheless, focus groups concluded that ideals presented online can elicit social comparisons for Instagram users.

Participant 3, Age 26: *"I think it can make you feel a little bit like um (..) worthless I think? Hm probably not the right word but I couldn't think of what the word was but some people like strive for, in whatever they want to do, the best and then you see some people like on Instagram, they have it sort of given to them sort of and in like uh, I'm not sure if you've seen this like, rich kids London or some crap… I don't follow it but my brother does and it's one of them things again where they flaunt all they've got and it's like (..) good for you, I guess, but you've been given that and you've not worked a day in your life and we know this because you're eighteen with a Lamborghini, you know what I mean you don't work urm, and then obviously you've got people who go out and work like fifty, sixty hours a week you know, struggling to pay the bills, I think that's a massive impact on people you know"* ***Focus Group 2 Offline Male***

Appearance expectations were described as a social pressure, whereby interactions with peers were framed as encouraging the expectation to change aspects of physical appearance. For example, in focus group eight, one participant recalled how comments made during "real life" interactions, favouring an ideal body shape (e.g., females favouring tall men or males favouring toned body shaped women) contributed to expectations to achieve physical features that were expressed as favourable. Specifically, participants developed the discussion in response to this by framing these appearance expectations as becoming normalised on SNS, whereby the likes of influencers were described as taking favourable appearance ideals from offline social expectations and bringing them into an online setting. Participants agreed with one another that Instagram was the main platform whereby users felt expected to meet the aesthetic appearances and trends in body image that were conveyed by other users on the platform. This created the impression of societal expectations around physical appearance as

being ever-present for comparisons on Instagram and alluded to an increased social pressure to meet certain aesthetic expectations for users. As a result, focus group discussions suggested that SNS platforms further reinforced the normalisation of idealistic representations of the self through posts that conveyed body and beauty expectations via a more image-based medium.

Participant 4, Age 20: *"It is hard not to compare yourself sometimes especially now with this unrealistic expectation of having a slim waist, but a big bum and thighs. It used to be being skinny and having a thigh gap, now it's a craze of having bodies like Kylie Jenner"*

Participant 3, Age 20: "*I agree P4, Instagram is the platform (in my opinion) that stays most in touch with current societal expectations, no matter how ridiculous or unobtainable, and normalizes them."* ***Focus Group 8 Online Female***

5.6.2.2 Distinguishing what is real and not real

Participants revealed perceiving some content on Instagram as being fake and not real. In particular, participants attributed edited images and aesthetic enhancements (e.g., cosmetic surgery) in posts as presenting an enhanced image of others. Many participants referred to their ability to obtain the same aesthetics presented, and where enhancements were described as less obtainable for them (e.g., the inability to afford cosmetic surgery), participants described seeing the people portrayed within those posts as less real and unrelatable. Participants also described difficulties in discerning content portraying real lifestyles vs. non-real and edited content, forming an impression that consistent exposure to this type of content made it more difficult to distinguish the extent to which the content was real or not. When discussing enhanced content in focus group eight, one participant positioned SNS users as being responsible for identifying differences between 'real' content and edited content. This however, elicited a mixed response from another member of the group who referred to discernment between enhanced and 'real' content as being more complex, whereby the

complexity of user discernment to content was framed as the user's ability to allocate their knowledge of digital/cosmetic enhancements whilst using Instagram. Subsequently, this created the impression that difficulties in distinguishing enhanced content were detrimental when comparing to others online due to the ease of becoming caught up in the highlight reel depicted on SNS.

Participant 4, Age 20: *"I'm not trying to generalise, but most people fail to realise that these people often use a lot of editing on their photos to look a certain way and even surgery in some cases and people then compare themselves to this unrealistic image which can be very damaging"*

Participant 3, Age 20: *"I agree (...) but I don't think it's always that simple. Your confidence is influenced by what you see, and even though you may have this knowledge about fillers/surgeries I think it is very easy to get caught up in the fantasy if that is what is being implied as beauty"* ***Focus Group 8 Online Female***

Participants proposed having a responsibility to distinguish between real and non-real content. Participants revealed trying to be critical when viewing posts, often taking into account the background and profession of other users to gauge how they are able to present their lifestyles. SNS users that were described as failing to recognise images that portrayed digital alterations were described as taking content at face value, without any critical thinking towards images posted. In particular, many participants expressed concerns surrounding younger, teenage SNS users who were described as being more impressionable and less able to be critical towards content, and thus less likely to be able to distinguish between content presented online and offline life due to growing up in an era of SNS platforms. As such, discussions between participants emphasised the importance of being critical of content posted online as enabling an increased awareness towards potentially misleading and false content.

Participant 1, Age 24: *"That's actually really interesting in the fitness community, there's a lot of home fitness people that are not doing any of the workouts that they post, so they're marketing things that don't work, like oh let's do these glute bridges and then they go in the gym and they deadlift a hundred kilos like, that's what's giving you the booty, it's not that thing you're selling them, you're selling them like programmes and diet plans that they're not following themselves and when I was young, I don't know if any of you remember this, but there was like this TV shopping thing like really early, like back in the day? (…) Yeah so there was like a skin care brand that was always on and I was like, thirteen, fourteen and I was like, oh my god, this will cure everything, because I had no capacity to think that that wasn't the case but they're telling me that it's working and this person is using it and look at her skin (..) I have no capacity for thinking it was marketing and that is was real (..) so I think if I'm growing up now, and I'm fifteen with Instagram, looking at all these things that are going to solve all my problems, like yes that's amazing, can I buy that"* ***Focus Group 1 Offline Female***

5.6.2.3 Balancing envy and motivation

When considering comparisons, many participants described viewing influencer and fitness images as envy provoking. Within focus groups, feelings of envy were described in the context of wanting what influencers and fitness trainers had, with the perception that they were unable to attain it. For female participants in particular, fitness images elicited descriptions of envy due to the portrayal of toned body shapes. In contrast, one male focus group described feelings of jealousy as they perceived idealised images of men as 'threatening' and viewed those presented in idealised images as being a higher status than them. In this focus group, jealousy was framed as intimidation from other men's body shapes and clothing that gave the impression they were of higher status than participants. As a result,

participants described feeling that their own status would be perceived as lesser if compared against those who were viewed to be of higher status than themselves.

Participant 1, Age 32: *"This guy for obvious reasons cause he's got that like (.) ideal male body, so already I don't want to take him seriously because I see a higher status than me in some way, shape or form… And I'm not, or I (.) I would put up more barriers towards taking him seriously (…) Yeah, so I think that that's where my annoyance comes from is that it is a bit of that jealousy and being threatened"*

Participant 3, Age 26: *"Absolutely (…) this guy is the most intimidating because he's (.) like you said, he's got the most idealistic male body you know if you walk into a room with this guy, he's going to take centre stage and almost everybody, male or female then is going to look at him"* ***Focus Group 2 Offline Male***

Influencer images were also described as providing motivation for participants to engage in healthier lifestyles. For some participants, this motivation was inherently driven by the desire and envy to look like people presented in influencer and fitness images. Other participants, however, drew upon the ability to find workouts and exercise tips from influencer and fitness content as providing motivation to stay on track and keep them accountable whilst embarking on a healthier lifestyle. These differing viewpoints towards influencer and fitness images elicited suggestions of finding a balance between envy and motivation to protect against negative emotions and impacts to well-being. In particular, as a way to maintain a positive balance, many participants described using SNS intentionally and setting expectations regarding their personal ability to achieve fitness goals, with the acceptance that they may not get to the level portrayed by influencers.

Participant 4, Age 23: *"I'm not actually getting intimidated of you know feeling bad about not looking like them because I sort of, have this process of, some people do it as a*

profession, it's a lot so you know I think the influence also comes from your own self in a way and (.) cause I use to be very obese (..) how I took it when I saw other people looking good, I was like you know what, I can work to get to a similar level, I don't want to get to that level, so in a way I sort of made it into a positive impact but at the same time, you may have people who may not take it like that and if you present it the wrong way as well (..) as an influencer I mean (.) a lot of people may feel bad" ***Focus Group 2 Offline Male***

Some participants however, revealed that users may have difficulties in finding a balance when viewing idealised content. Participants created a sense of doom whereby feelings of self-doubt and self-deficiency were described in the context of the inability to attain ideal lifestyles. In particular, influencers were blamed for the consistent portrayal of ideal lifestyles, which were referred to by participants as creating an impression of 'normality', especially on younger Instagram users. Within the context of finding a balance on SNS, this resulted in one focus group framing influencers on Instagram as being the only people who portray ideal lifestyles, suggesting that for other users and for people in 'real life', this lifestyle was unattainable. As a result, this gave the impression that some Instagram users may consider ideal lifestyles portrayed by influencers as an aim to attain for their own lives, by which participants described feelings of self-doubt and self-deficiency in the context of users being unable to meet personal expectations of achieving influencer lifestyles.

Participant 3, Age 23*: "All the teenagers, I think that's why they are the product, because they go out and they try to buy all these products to make them like their influencer (..) cause they think if they have that product or if I have that nice pyjamas I can lounge in style like her on a Sunday (.) no one really lounges in style on a Sunday! Except for the people on Instagram"*

Participant 1, Age 24: *"No but at least back in the day it was at least like magazines, like clearly someone took that picture, whereas now well it must be their lives because well it's on*

their social media and they're up there every day, surely this is how they live (..) That's not like, I would a hundred percent go back into well there's something wrong about me, because this is not my life and if this is what all the popular people are doing and this is what all the people who are happy and in relationships and this is what they do, then I'm not, I can't achieve that, and that's when you go into well I'm just doomed for being lonely, and I'm just doomed for always being like third choice, like that is immediately where I would go" ***Focus Group 1 Offline Female***

Focus group discussions elicited mixed feelings surrounding the exposure to idealised content in this theme. Influencers and fitness models were framed as setting appearance expectations that were accepted by a wider group environment of SNS users on Instagram. As a result, participants positioned themselves as different from users who were viewed as influencers or fitness models, drawing upon financial and external restrictions as preventing the ability for other users to meet these appearance expectations. From this, distinguishing what is real and not real, and balancing envy and motivation towards idealised content were suggested to be behaviours created by users in response to wider social expectations on Instagram.

5.6.3 'Fake it till you make it': Seeking validation and social acceptance

Participants drew upon features of SNS such as Instagram that contributed to the ability and motivations to construct and present their best self online. Many revealed that how much they portrayed themselves online was dependent on the type of SNS platform they were posting on, the number of followers they had on the respective platform, and whether employers or family members would view the content participants posted. Instagram in particular was framed as the platform on which users 'fake it till they make it', whereby participants viewed the ability to present, curate and enhance content as a way to portray their best self to their followers. Moreover, participants referred to likes and comments from other users as being

main features in the context of discussing self-esteem and anxiety. Likes were described as the main gauge for popularity and validation, whereby more likes received on a post were perceived to reflect more popularity. Similarly, negative comments that initiated conflict or criticism towards the user in posts prompted participants to describe feelings of anxiety when posting content in fear that they would be criticised. As a result, these features of SNS elicited discussions of how likes and comments received can impact well-being. The portrayal of self and seeking validation are further explored in the subthemes: *(i) Enhancing self of Instagram, (ii) The 'social currency of likes'* and *(iii) Navigating opinions, conflict and criticism.*

5.6.3.1 Enhancing self on Instagram

Participants described expressing different parts of themselves dependent on the SNS platform used and the number of followers they had. Instagram was framed as a main platform for impression management and identity construction due to its image-focussed environment, eliciting descriptions of Instagram as a space where users construct and present their best self. Participants agreed that identity construction was associated with the followers of accounts and was described in the context of users creating newsfeeds to present how they want their followers to perceive them, which made participants refer to their own awareness of how they represented themselves on their profile. Some participants drew upon posing to present themselves in a flattering way, with female focus groups in particular reaching a consensus of feeling 'trained' to pose in a stance that is most figure flattering; a perception that was described as being formulated by viewing other female users, influencers and models on SNS posing in the same way. For other participants, the filtering and editing tools available were framed as encouraging image enhancements and touch ups. For all participants, the construction and portrayal of their best self was referred to as a way to receive positive feedback and approval for their identity in the form of likes and comments

on the pictures posted, whereby a higher number of likes was viewed as positive approval of their image and digital identity.

Participant 1, Age 22: *"I'm really aware with how the girls in particular are standing because they're posing in ways that are really like figure flattering, like putting one foot in front of the other boom boom boom that's a really common way, a bent elbow is a really common way, like leaving a gap between your arm and your body I don't even know how I know this but like… if I was taking a picture, I would also stand this way because it's almost like I've been trained to stand this way because I know it's the most flattering way"* ***Focus Group 3 Offline Female***

Participants reminded each other that the overuse of filters to enhance photos may also initiate negative feedback from others. Participants described finding a balance of using filters on images, whereby noticeable editing was viewed to elicit negative comments from other users, particularly in regard to selfies and full body photos. Negative feedback was described in the context of accusation, whereby users would criticise edited images for not being natural. Within focus groups, this negative feedback was framed to result in a cycle of verification, in which users who were criticised would consequently limit or stop editing photos as a way to prove they are presenting their natural self and to protect their representation on Instagram, but revert back to editing images due to the motivation to portray their best self. As a result, focus group discussions gave the impression that criticism from other users would result in conformity to gain approval and positive feedback of one's identity.

Participant 3, Age 20: *"I mean it's not good to edit too much because again if you edit so much things might actually (.) the tables can be turned (.) like if you post a picture with too*

much filters and erm anything with editing stuff some people are actually out there, they might actually write in the comments, oo so much editing"

Participant 1, Age 22: *"Yeah (..) our whole perception of what's like real on Instagram is kind of really skewed because some girls post pictures and not have them edited at all but like (.) for whatever reason people might think that they've edited them or like accuse them of editing themselves and it it's that constant need to verify that you're natural or that you actually look like that and then a way of like editing is just a way of (.) a lot of people do it because they're self-conscious and they just want to put forward like the best version of themselves"* ***Focus Group 3 Offline Female***

5.6.2.1 The 'social currency' of likes

Participants described SNS as a 'marketplace' of users, whereby likes were perceived the 'social currency' for popularity and validation. This marketplace metaphor was extended upon in discussions with participants describing an almost commercialised process when posting images on SNS to receive as many likes as possible. All participants agreed that likes were a way of feeling validated and worthwhile, and referred to their content as being accepted by others when it was liked. Similarly, participants considered likes as a way to gauge how popular a user was, and described likes from others who were not close friends or family as a means of affirmation that they were worthy as a person. This gave the impression that the more likes a user had, the richer they were in the marketplace of SNS users and likes, whereby the richer the user, the more accepted and popular they were perceived to be. As a result, participants revealed to each other how they would try and increase the likes received on their posts as a way to feel accepted and to feel better about themselves. Some participants described using hashtags to reach a wider audience, which was discussed as a way of advertising their posts or 'buying' likes from others outside their following to gain as many

likes as possible. Other participants revealed using a business Instagram profile which enabled them to see what times during the day they received most likes on their posts so that they could post content at those times to gain the maximum number of likes. Thus, participants agreed that feelings of popularity they gained from the number of likes contributed towards feeling validated as they felt they were noticed and paid attention to by others.

Participant 4, Age 27: *"I used to get massive validation from likes on Instagram when I was younger, so I got it when I was like twenty-one maybe? (..) I used to buy my likes as my brother calls it, so I'd go on holiday, and I'd be like, hashtag Croatia, hashtag beach life, hashtag sea, hashtag sand, hashtag hashtag hashtag hashtag hashtag yeah, cause I wanted people to see it and I wanted to get the likes, and if I only got like six, I'd be very tempted to delete it"*

Participant 1, Age 24: *"If I'm having a crap day, a couple of likes makes me feel better, and the fact that they do is interesting, it's like a convenient way of being reassured that even if you're having a crappy day or if you're not wanting to buy the people that you're wanting to buy [gaining certain people's attention], and least some people are paying attention to you (...) But genuinely, it is something that you feel you have to, hey look at me and in many ways it's like your social currency, cause it is how, how people judge if you're popular or not"*

Focus Group 1 Offline Female

The number of likes that were perceived as enough to feel validated by others was often gauged by comparing the number of likes received to both other users' posts, and previous images participants posted themselves. When participants felt that not enough likes had been received on a post, some revealed having feelings of embarrassment often attributed by thinking that other users would look at the lack of likes on the post and believe the poster had no friends or was unpopular. As a result, this elicited descriptions of impacting their self-

esteem and confidence, as participants described feeling they were not liked. Specifically, less likes were considered to prompt thoughts of why they could not be like other users, and whether they had done something wrong in their post. Due to this, some participants revealed they considered deleting the posts so that others would not see the lack of likes they had received. Other participants revealed using Instagram as a space to share photography, and thus described basing the value of their work from the likes received. In these discussions, less likes prompted participants to believe their photography was not of value and subsequently led them to post less content as they felt it was not good enough to be posted on SNS. During these discussions, participants also referred to their inability to distinguish whether the lack of likes was due to the image posted or the person themselves, giving the impression that a user's content on SNS was perceived as a part of that person.

Participant 3, Age 21: *"We value the quality of our [photography] work according to the attention we get on social media in the form of likes and comments. This has also affected my photography work since as I started to have less feedback and interaction on social media, I have stopped posting completely, and consequently stopped taking pictures in the first place. It's definitely destructive as much as it could be constructive, in some situation."* ***Focus Group 5 Online Male***

Some participants revealed that they did not feel validated from likes received on Instagram as they were perceived to be artificial. This artificiality was described in the context of bots on Instagram, enabling other users to gain likes, comments and followers based on an algorithm, which participants framed to be a false comparison if comparing the number of likes of a post to their own. Instead, feelings of validation were described as being gained from other aspects of personal, offline life, for example, romantic relationships or family. As a result, participants suggested gaining validation from offline relationships and interactions to enable engaging with SNS differently and to encourage focus on using SNS for users to

develop themselves, as opposed to comparing their likes and comments to others for validation.

Participant 1, Age 24: *I've been in a solid relationship for about four years now, and that is like a constant affirmation that I'm worthwhile, to someone who's not my family or my friends, that settles so much of it for me (...) I feel like I have affirmation in my life that I'm worthwhile from other people, and that made me be able to settle into focussing on these things that make you attractive to other people, so instead of, for example, one of the clean and toned, like the girl in that picture there modelling the sports clothes, it's like right, but I want to lift more weight, I want to run a mile faster like it's not that I'm interested in different things, but it's that (..) I have the validation from elsewhere (..) so I can approach the social media slightly differently"* ***Focus Group 1 Offline Female***

5.6.3.3 Navigating opinions, conflict and criticism

Participants referred to comments as being the main medium on SNS for sharing opinions, conflict and criticism towards other users. Opinions and criticism towards users' posts in particular were framed as the most negative and impactful towards well-being due to the ability to target aspects of others' lives (e.g., appearance and career) in a more personal manner, whereby comments were positioned as having the ability to lead to active debate and conflict on a post as opposed to likes. Within discussions, this led to descriptions of 'keyboard warriors'; individuals who were viewed as those who would bully and treat others antisocially online where they would not in offline life. Descriptions gave the impression of these types of people on SNS as predatory, with features of SNS (e.g., accessibility of the platform and instantaneous ability to comment) giving them the power and opportunity to 'attack' other users. In particular, participants expressed concern surrounding comments to be misunderstood online, as this was framed to initiate conflict within larger groups of people within the comments section against one person, with the potential of exacerbating the impact

on the receiver's well-being due to being the target of criticism. As a result, many participants illustrated posting content as a form of inviting interactions from others and giving the opportunity to others to give opinions and criticise content posted. However, within one group, one participant acknowledged that the SNS user's relationship to the content poster may play a role in how the post is interpreted and the subsequent interactions that may be received. This directed another member of the group to describe how users may post to revive contact between friends, indicating posting content for positive interactions. Thus, while all focus groups predominantly agreed that comments were a main avenue for criticism towards others, discussions also created the impression that comments may also encourage positive interactions between users, dependent on the context of their relationship.

Participant 3, Age 20*: "Social media seems to make everyone's business, everyone's business if that makes sense. You post a photo to Instagram and everyone thinks they then have the right to comment on you or have an opinion on what it is you've posted (…) I think if you engage a lot with other accounts, with larger discussions or just frequently posting, you are going to have to face the more negative side of social media at some point because you're inviting more interactions from other people. Although this can be positive, there will always be someone who disagrees and someone involved will experience negative effects on their well-being (…) people have the opportunity to act in maliciously in ways that would not be accessible without a social media platform (…) They can attack everything from a person's appearance and self-esteem, to their physical career. Just because they acquired that little bit of extra power from having a social media platform"* ***Focus Group 8 Online Female***

Participants framed navigating criticism received as being the responsibility of the individual who is posting content. In particular within one focus group, participants recalled and reminded one another of Instagram introducing a feature which allows users to control and

moderate negative responses received on a post. For some participants, this feature was regarded as useful in reducing criticism due to the ability to turn comments off. Others however, proposed that SNS users needed to know that the feature was available in order to enable it and limit negative comments. This created the impression that users need to be aware of new features that are introduced to platforms for it to minimise impacts on well-being.

Participant 2, Age 18*: "The comments section are always where the most negative content is being spread on Instagram, and on most social media platforms to be honest"*

Participant 3, Age 23: *"Instagram has introduced a feature long back that you can restrict people who are commenting on your post which was a tremendous initiative according to me, as it deffo reduces the amount of the backlash or the criticism coming to one's post"* ***Focus Group 7 Online Male***

Within discussions, participants also described a reciprocal nature of judgement whereby they inherently judged the way other SNS users represent themselves in their posts, whilst their own followers also judged the content participants themselves posted. For many participants, the ability to judge was described as being made easier on SNS platforms as new content was constantly available and they felt that they were able to spot enhanced and edited images. Other participants drew upon the curation of profiles as giving them a 'license to judge' whereby they framed content posted by other users as content open for opinion and judgement due to the voluntary nature of posting. In particular, focus group one referred to the intentions of judgements online as creating a cycle of judgement. For example, one participant revealed judging users on Instagram as a way of forming an opinion of them and described having an expectation that other users would reciprocate the same form of judgement. In response, another member of the group referred to how all group members had

judged pictures of Instagram fitness models and 'normal users' when presented during the discussion, despite revealing not wanting to be judged themselves online. As a result, this led to the group to frame their judgement of other users as a way to enhance their own position as an Instagram user, particularly if the content was viewed as undesirable (e.g., too many pictures uploaded or drunken images). Thus, all participants agreed not wanting to be judged by others and reflected on the hypocrisy associated with judging others, creating the impression that the hypocritical nature of judgements were a way for users to position themselves as better users than others, encouraged by the ease of viewing content online and forming opinions of other Instagram users' posts.

Participant 3, Age 23: *"Everyone wants to judge other people but no-one wants to be judged and they're like, oh it doesn't represent who I am now but they're like, oo that represents who you are, even though it's like old (..) and I feel like a lot of it is also like us wanting to do it?"*

Participant 1, Age 24: *"I think it's very true (…) I dunno I've become so self-aware like even if, it's like we're talking ourselves, at least I'm talking myself up like, I use my social media this way, look at me compared to all these people taking pictures, it just like encourages all that judgement doesn't it"*

Participant 3*: "Yeah, to be fair I just judge people for being so involved in their Instagram"*

Participant 1, Age 24: *"No but that's the thing, is that we all judge people for all sorts of things* (…) *inherently you judge things, it [SNS] just makes it so easy, it makes it so, like I can just boom ((clicks fingers)) someone had a good day, yeah you clearly edited that, someone clearly airbrushed something right there (…) we're judging these people about how they're presenting themselves and how we don't want to be judged about how we present*

ourselves (..) there's just such an element of like, hypocrisy but we all buy into it because it makes us feel good or it works to our advantage"

Focus Group 1 Offline Female

Within this theme, Instagram was positioned as a main platform for identity construction and impression management. Likes and comments were referred to as an avenue of providing validation and feedback for one's identity online, whereby the photo-based environment of Instagram was framed to encourage users to portray their best selves through image enhancements (e.g., filters and editing tools) as a way to ultimately acquire positive feedback and validation. As a result of portraying a best self, judgements online were indicated to be a hypocritical behaviour created by users to position themselves as better than other users when viewing content. Moreover, it was revealed that interactions experienced within comments are dependent on the social relations and wider online community the user is a part of, whereby either criticism or support may be elicited in comments in accordance with this. As such, positive comments were considered a benefit for connecting with others, albeit navigating conflict and criticism online was framed as an expectation for users when seeking validation and social acceptance through posts.

5.7 Discussion

The present study aimed to explore the role of SNS use in body image and well-being, with a particular focus on the platform Instagram, whilst also seeking to identify the specific features of Instagram that may impact body image and well-being. Descriptive results found a relationship between gender and Instagram use, with females spending longer on average on Instagram across a seven-day period. A relationship between age and Instagram use was also found, with results showing Instagram use decreases as age increases. Qualitative findings revealed how attitudes, behaviours and motivations were socially constructed around

Instagram engagement and body image. This holistic insight framed Instagram use as negative in the context of anxiety, self-esteem and body image satisfaction. It was also found that Instagram features may also provide an avenue for well-being support and connectedness to others. Overall, the present study extends upon prior literature to consider the impact of interactive features, such as likes and comments, on SNS platforms in the context of well-being (Chua & Chang, 2016; Dumas et al., 2017). The significance of image-based SNS impacting on body image and well-being are discussed in the following section.

Objective Instagram screen time use was shown to have a weak negative association with age in the present study. This suggests that older Instagram users are likely to use Instagram less, extending upon previous research within the context of the uses and gratifications theory (Katz et al., 1973; Sheldon & Byant, 2016). It has been indicated that younger SNS users (under 30 years old) are motivated to use SNS for the social and interactional engagement afforded by the platforms, whereas older SNS users (over 30 years old) have been shown to value social relationships in offline social networks as opposed to online networks (Chang et al., 2015; Bruine de Bruin et al., 2020). This suggests that motivational priorities change with age (Carstensen, 2006), and therefore the relatively lower screen time observed within the older users in the present study may be explained by a change in SNS usage priorities. This was further extended upon with the qualitative findings of the present study, in which older participants revealed that motivations of Instagram usage changed from social engagement to more informational usage, when discussing the ways they interacted with Instagram in the theme *'Developing caution'*.

Within focus groups, the decline of Instagram usage was also discussed within the context of increased caution and safety on the platform. Therefore, it may be that participants were more conscious of how long they interacted with the platform as a way to feel safer and mitigate potential negative interactions (Redmiles et al., 2019). However, whilst the objective screen

time measure within the present study was able to capture real-time data allowing for the collection of more ecologically valid data than traditional retrospective measures (Csikszentmihalyi & Larson, 2014), general screen time cannot capture the nuances of interactional behaviours and engagement online, highlighting the need for more nuanced objective monitoring in future research to capture the naturally occurring behaviours and patterns on Instagram (Bentley et al., 2018). Nevertheless, the objective data utilised alongside the qualitative findings of the present study provided holistic insight into the ways users engage with Instagram, in addition to their attitudes around Instagram use and well-being. These are discussed further in the below sections.

The qualitative element of the present study provided further insight into the influence of Instagram engagement on well-being and body image. Findings illustrated Instagram as reinforcing body ideals that have been normalised in an offline setting. This is in line with previous literature that has found appearance-focussed conversations amongst peers as being associated with heightened awareness and attention to appearance ideals (Clark & Tiggemann, 2007; Webb & Zimmer-Gembeck, 2014). Indeed, the social interactional domains from the social environment and peers can influence the construct of body image ideals (Kleemans et al., 2018), indicating that attitudes and behaviour can be learned through conversational interactions, whereby attitudes towards body ideals are transmitted through dialogue with others. However, the results of the present study suggest that SNS may combine aspects of both offline and online peer and media influences. Body and appearance expectations were framed by participants as being developed through offline conversation, before being endorsed further through influential figures on Instagram. Indeed, the image-based environment of Instagram provides a medium for images portraying appearance ideals in addition to an interactive element for peer feedback (Meier & Gray, 2014; Rodgers, 2016), and it was illustrated in the present study that feedback through comments made on posts

exerted either appearance-enhancing or appearance-derogating attitudes and behaviours dependent on whether comments were favourable or unfavourable to the content showed. This indicates that online users on SNS may amplify appearance-focussed content by intensifying the presence of certain photos through liking and commenting on content, subsequently adding meaning and valence to appearance-based media (Rodgers, 2016; Kim, 2020). Exposing users to an increased appearance-focussed range of content may therefore reinforce offline representations of beauty via an image-based platform, subsequently directing viewers' perceptions of body ideals. As such, this suggests the need for further research to explore the combined offline and online social influence, in addition to the interactional features SNS affords, in the context of body ideals.

Participants framed the interactional element of likes and comments as having the potential to influence self-esteem and feelings of anxiety in the context of self-presentation online. Specifically, presenting an ideal self was highlighted as driving the desire to gain validation and identity approval from other Instagram users. This is in line with the self-enhancement and self-verification motives of self-presentation, whereby individuals present positive, enhanced self-images to seek a positive self-view, and to seek verification and feedback, respectively (Zheng et al., 2020). It has been highlighted that digital photographs have become a constituent for a person's identity, and demonstrate the image a person chooses to display (Mascheroni et al., 2015). Thus, it could be argued that within the context of Instagram, self-presentational behaviours and motivations are unique due to its image-based environment. Specifically, Instagram can afford features that users can utilise to carefully select and manage the impression they project on their profiles by selecting information to share and by actively limiting information (e.g., choosing photos to upload and using filters), which can be motivated by the drive to gain validation and attention (Gentile et al., 2012; Chua & Chang, 2016). Indeed, this was drawn upon within the qualitative findings of the

present study, whereby Instagram was viewed as a 'highlight reel', whereby users were perceived as only showcasing positive sides to their appearance and lifestyles. Liking pictures was considered to be the main gauge for popularity and validation, supporting previous research that has demonstrated likes to be a marker of peer status, popularity and peer approval (Dumas et al., 2017; Tiggemann et al., 2018). This suggests that a lack of likes received on posts may be perceived as not meeting standards of peer approval or popularity, which in turn may contribute to lower self-esteem and anxiety in posting further content, as drawn upon in the present study. As such, this gave the impression of photographs online as being a tangible way for Instagram users to communicate and interpret the idea of beauty and appearance ideals through interactive features such as likes (Chua & Chang, 2016).

The importance of likes was further highlighted when participants revealed they monitored the likes they received on content they had posted. Specifically, it was revealed by two participants that Instagram business profiles enabled features for users to track their views and likes on their posted content, subsequently informing the user of the best times to post content. This gave the impression of a commercialised process of posting, whereby likes were a 'social currency' for popularity and validation. From a social exchange perspective, a user's behaviour can be framed on the basis of social interactions, which may be affected either positively or negatively by their Instagram followers (Lin, Chou & Huang, 2021). As such, the presence of these interdependent transactions can be of great importance to SNS users, which in turn may encourage users to obtain more benefits from these social exchanges (e.g., increased number of likes leading to feelings of validation and popularity). This may explain the monitoring of likes, whereby users evaluate their perceived net benefit from posting and disclosing themselves online. Thus, by using an Instagram business profile, users are able to maximise the benefits of likes, whilst minimising the cost of communication with other users (Surma, 2015). These findings suggest that the reciprocal exchanges on Instagram

may shape posting behaviours of users online, and highlights the need for further research to explore the influence of these interpersonal evaluations and exchanges on Instagram usage behaviour. Doing so can provide further understanding regarding the motivations of posting and monitoring the interactions of specific content, in addition to further knowledge on the gratifications received through interactions with content posted.

Physical appearance-related comments were viewed by participants as having a negative impact on well-being and body image. Specifically, criticism and opinionated comments were viewed as a form of negative feedback, whereby comments were framed as having the ability to encourage users to change their self-presentation to become either more digitally enhanced or more natural looking (e.g., wearing less makeup if comments suggest they use too much makeup). This implies that physical appearance conversations among users online may play a role in the reinforcement of physical appearance in self-presentation (Tiggemann & Barbato, 2018). That is, users may conform to what is expressed as normative appearance ideals by other users (Flynn, 2016) to gain approval and seek positive feedback. Furthermore, participants within the present study described feelings of anxiety in the context of posting photos in fear of receiving criticism. This suggests subjective norms may be at play within the Instagram environment, whereby the motivation to protect self-representation on the platform is attributed to the drive of changing appearance presentation in accordance with what is approved by others to avoid the associated negative consequences (i.e., criticism) of presenting non-normative appearance ideals (Bergstrom &Neighbors, 2006). Taken together with the use of likes, this suggests that Instagram users gain an understanding of the type of appearance-based content that is expected and respected by the Instagram community, as a result maintaining and reproducing these socially endorsed appearance norms within their own posts (Santarossa & Woodruff, 2017).

However, findings revealed that the interactive features of Instagram also provide a benefit towards well-being, especially surrounding the ability to initiate contact with others via comments, as well as through being able to reach out to like-minded communities for connections and support. This supports previous findings which have indicated SNS platforms as a space for social support (Cannon et al., 2017), information, and sharing experiences (Naslund et al., 2020). Indeed, the interactive behaviour on SNS can represent acceptance and create connectedness amongst the online community (Santarossa & Woodruff, 2017), suggesting that such interactions may increase the social presence between the interacting users (Décieux et al., 2019). In particular, it has been demonstrated that active SNS use (e.g., commenting and direct messaging) is more likely to have a positive impact on well-being in comparison to passive SNS use (e.g., browsing and scrolling through content) (Burke et al., 2010; Deteres & Mehl, 2013). That is, directed communication online may have the potential to improve bonding and bridging social capital through strengthening self-disclosure, supportiveness, and positivity, with comments providing content for conversational grounding and revealing similarities between Instagram users (Burke et al., 2011). As such, this indicates that communication online with others is likely beneficial for encouraging support networks, in addition to the growth of new relationships and the maintenance of existing ones. Indeed, there has been growing interest in the use of SNS for support within minority and clinical populations (Cannon et al., 2017; Naslund et al., 2020), thus the interactional features of Instagram should be explored further in this context, with further research also needed to highlight interventions to support well-being online.

Comparisons to other Instagram users were also negatively framed in the context of well-being within the present study. Comparisons made on Instagram and the influence of idealised content can be conceptualised using social comparison theory, whereby individuals evaluate aspects of their lives by comparing themselves to others (Festinger, 1954). Previous

research has shown that upward comparisons can create feelings of envy and body image dissatisfaction (Tiggemann & Zaccardo, 2015; Chae, 2018). In an SNS context, it has been shown that feelings of envy often occur in individuals with similar characteristics, and whilst it has been suggested that influencers are "micro-celebrities" (Khamis, Ang & Welling, 2016), it has also been proposed that the connection influencers have with their online audience falls between that of celebrities and distant friends (Chae, 2018). Establishing their following by sharing various parts of their lives makes influencers more relatable to other users, which may in turn elicit feelings of envy and decreased self-esteem when a user perceives themselves to be lacking in what the influencer has (Abidin, 2016; Chae, 2018). Similarly, participants in the present study also expressed comparisons to peers online due to their ability to relate to them. This may be attributed to the perception that the appearance of peers is seen to be more attainable than that of celebrities, due to similar lifestyles and resources peers have to oneself (Fardouly et al., 2015). Taken together, this indicates that Instagram influencer content, and in some cases peer content, may provide greater exposure to daily appearance and lifestyle postings that can be used for comparisons and self-evaluation online. This may then encourage users' on-going awareness of appearance and lifestyle ideals online, and their need to attain these ideals. However, recent online campaigns have started to see a presence of body positive influencer content, and there has been evidence to show body appreciation may play a protective role against negative SNS exposure (Andrew et al., 2015). It is therefore important to consider the impacts across different, specific influencer types (e.g., fitness vs. body positive) to establish well-being influences on Instagram users.

Participants felt it was the users' responsibility to interact with Instagram content in a way that was beneficial to well-being. However, participants framed their perspectives of personal responsibility in a paradoxical way, whereby they diminished responsibility of their active

ability to curate settings on Instagram and instead blamed the platform for showing users content not wanted or searched for. This may reflect an ideological dilemma (Billig et al., 1988; English, 2009) faced by Instagram users in recognising the extent to which they are willing to actively engage with the customisation of their profiles and attributing fault to the platform for negative well-being effects users may face. SNS platforms pose complex environments in the context of demanding users to manage their online relationships with users, self-presentation and personal safety, and therefore current knowledge and efforts to encourage users to improve digital safety behaviours and skills online may be suboptimal. That is, current education initiatives and awareness campaigns often focus on simple digital skills (e.g., making SNS profiles private) (Capriotti, 2011). Thus, the platform may be blamed for perceived negative well-being outcomes as individuals see more complex digital functions available on Instagram (e.g., managing data and history) as beyond their control. This highlights the need for digital literacy to be shaped further by considering distinct affordances SNS such as Instagram provide and motives which encourage users' engagement with the platform (Livingstone, 2014). This also emphasises the need for developers of SNS platforms to re-evaluate the way they disseminate stakeholder content to other Instagram users, particularly in the context of the utilisation of tailored and personalised tools (Capriotti, 2011), which may expose users to content that in turn may influence negative body image and well-being outcomes.

5.7.1 Implications

The current findings have practical implications and reveal an avenue for SNS platforms in intervention efforts at both consumer and corporate levels. Digital literacy initiatives should consider evaluating distinct platforms and the affordances they provide to incorporate strategies and target more complex digital skills relevant to the specific platform, for example, addressing data management and content history. From a corporate perspective, the

present findings indicate the need for re-evaluation in the context of stakeholder content (e.g., content portraying appearance/body ideals) and the ways in which SNS platforms disseminate and enable interactions with content that may influence negative well-being and body image. Tailored and personalised tools on SNS platforms in particular should be addressed to evaluate and encourage clearer customisation of these settings for consumers on specific platforms. In light of this, future research should seek to further examine the role of tailored adverts in relation to well-being outcomes. In addition, research should further explore attitudes of user agency and responsibility using SNS to further develop understanding around protection of well-being online and how user behaviour can be shaped to encourage active agency in content viewed online.

5.7.2 Limitations

It has been recommended that to reach saturation in qualitative research (the point at which all constructs of a phenomenon have been explored and exhausted) (Glaser & Strauss, 1967; Hennik et al., 2019), 90% of themes within thematic analysis can be identified within six focus groups (Guest et al., 2016). However, as the present study implemented different modalities of collecting focus group data (i.e., both synchronous offline and online approaches), it is unclear how this may have influenced saturation. Nevertheless, it has been argued that saturation cannot be straightforwardly associated to the number of focus groups due to the meaning and meaningfulness of themes derived from the dataset (Braun & Clarke, 2021). That is, themes are developed and an interpretative judgement is made by the researcher as to when to stop with the coding process and move onto theme generation, and in this sense, new meanings are always theoretically possible (Low, 2019). Given this, the present analysis identified the most prevalent themes within the dataset, and allowed for the generation of detailed knowledge and understanding into perspectives and attitudes around SNS.

Furthermore, the participants within the present sample do not represent those experiencing dysphoric levels of body satisfaction and well-being, and their experiences using SNS platforms. For example, individuals with body image-based disorders may have different attitudes and experiences of using and interacting with appearance-based photos on content on Instagram. Despite this however, the exploration of experiences from a non-clinical sample within this study, can inform how some of the features of SNS, such as likes and comments, that may go towards influencing the maintenance and/or development of body-image based disorders. In addition, the objective screen time data collected in this study was limited as it did not allow for usage patterns on Instagram that may influence changes in well-being to be observed. Future research should therefore consider exploring the impact of Instagram use within other populations (e.g., clinical populations), in addition to assessing well-being outcomes in real-time, to further examine the relationship between SNS and well-being.

5.8 Conclusion

The findings of the present study showed SNS as being beneficial in growing and maintaining new and existing relationships with others, providing a space for sharing experiences and information. With this, SNS can provide a positive impact on well-being by creating a sense of community, connectedness and support. In particular, it was found that the communicative features of Instagram can help to facilitate support and enhance connections with others. However, Instagram was also framed as a platform for self-presentation and peer interactivity, reflecting an environment that can encourage self-evaluation and the construction and maintenance of appearance ideals. Addressing the perceptions and attitudes towards Instagram content and the features the platform provides, can therefore provide understanding into the ways users engage with image-based SNS, and provide insight into

shaping interventions to mitigate negative well-being and body image impacts for users online.

CHAPTER 6

Instagram engagement and well-being: The mediating role of appearance anxiety

The empirical study presented in this chapter investigates the mediating role of appearance anxiety in Instagram engagement and well-being. Whilst the study presented in Chapter 5 provided insight into how users socially construct attitudes around Instagram on well-being and body image, this study investigated the psychometric patterns of Instagram behaviours to better understand the underlying mechanisms associated with Instagram use and well-being.

6.1 Introduction

Previous research has examined well-being outcomes in the context of time spent online to establish the positive and negative relationships between social networking site (SNS) use and well-being outcomes (Twenge & Campbell, 2018; Stiglic & Viner, 2019). However, time spent using SNS can lack conceptualisation (Kaye et al., 2020), as oftentimes this can underestimate behaviours associated with SNS use, such as specificity of activities users engage with online (Kaye et al., 2020). Instead, research has begun to divide the way users use SNS into forms of engagement, in an attempt to clarify the ways individuals engage and interact with SNS platforms, by looking into patterns of usage and how users behave and engage with content and people online (e.g., posting on or browsing through SNS) (Verduyn et al., 2017; Stevic et al., 2019). Patterns of SNS usage may provide further insight into the influence of SNS use on well-being by pinpointing user behaviour when engaging on SNS platforms, and provide further insight into how interaction with SNS may influence well-being outcomes in SNS users.

SNS usage can be dichotomised into patterns of passive and active usage (Verduyn et al., 2015). Generally, active SNS usage refers to online behaviours that facilitate direct

exchanges between users, such as commenting, posting content and sending messages, whilst passive SNS usage encompasses the monitoring of other users without direct engagement, such as scrolling through newsfeeds and viewing posts (Trifiro & Gerson, 2019). Within the platform Facebook, it has also been suggested that active usage can be further classified into active non-social use, which includes direct communication without written content (e.g., RSVPing to events; Trifiro & Gerson, 2019). Active SNS use has been demonstrated to have positive effects on users, which is often attributed to the social connectedness promoted through active SNS usage (Vitak & Ellison, 2012; Tazghini & Siedlecki, 2013). SNS can allow for the expansion of a user's network, which can help individuals obtain new information and maintain connections with their peers, which in turn can lead to greater feelings of self-worth and feelings of belonging (Verduyn, et al., 2017). Furthermore, research has also demonstrated active use to positively predict perceived support on SNS, which in turn can decrease depressive and anxiety symptoms (Frison & Eggermont, 2015), suggesting that active use can lead to enhanced levels of self-esteem and well-being through feelings of social connectedness gained online.

Passive SNS use can be detrimental to SNS users as users observe more, rather than interacting with others online (Shaw et al., 2015; Young, et al., 2017). Specifically, the information users gain from others through browsing online content may impact well-being through self-evaluative behaviours and social comparisons (Donnelly & Kuss, 2016). As discussed in Chapters 2 and 5, SNS platforms can provide a number of features that make comparisons likely, particularly when user encounter content portraying the attractive presentations of others (Lup et al., 2015). In particular, negative comparisons have been illustrated to increase the risk of rumination in individuals, which can lead to maladaptive cognitions such as self-criticism and decreased self-esteem, in addition to symptoms of anxiety, depression and body dissatisfaction (Haferkamp & Krämer, 2011; Cohen &

Blaszczynski, 2015; Donnelly & Kuss, 2016). In particular, literature has shown that comparisons may underpin body image perception, highlighting a negative relationship between comparisons made on SNS on body image satisfaction when using SNS passively (Kim & Chock, 2015; Tiggemann & Zaccardo, 2015; Tiggemann & Anderberg, 2020). Moreover, individuals engaging passively with SNS are likely to receive less feedback and attention from others within their social network, which may undermine feelings of belonging and self-worth (Chen et al., 2016). That is, self-esteem is gauged through cues of rejection or inclusion from the social environment. Therefore, the way individuals feel about themselves is a dynamic gauge of their relational value (Leary, 2005). Many SNS users use SNS to build social capital and network with others, which indicates that an individual's self-worth may be related to the amount of engagement in their social network, as well as the engagement of other users with their social networks (Vogel et al., 2014). Consequently, users engaged passively in SNS receive fewer cues of inclusion (for example through feedback), and may experience threats to their belonging on online networks, in turn undermining their self-esteem (Chen et al., 2016). As a result, this indicates that passive SNS patterns of engagement are likely to lead to lower levels of self-esteem in Instagram users.

Conversely, there is some evidence that passive SNS use can be beneficial for well-being. Research has shown that passive use can enhance rather than decrease well-being in users of Instagram (Beyens et al., 2020). Users may seek positive content on the platform to browse, such as humorous content art or positive quotes, which in turn can lead to feelings of enjoyment or feelings of support (Radovic et al., 2017). This may be due to the anonymity of being able to view content online, and where content may provide emotional social support, may lead to decreased feelings of isolation (Naslund et al., 2014; Radovic et al., 2017). Subsequently, this may lead to feelings of social connectedness indirectly through content purposefully viewed, thus enhancing outcomes in well-being. This suggests that the context

of content on the platform could play an important role in well-being, and highlights the need for further research to explore the relationship between passive SNS use and well-being outcomes. As such, the inconsistencies highlighted within the literature emphasise the need to further understand the relationship between SNS usage patterns on well-being. In particular, the diversity of affordances provided by Instagram (e.g., ability to follow a variety of people, from peers to celebrities and influencers, to communicating directly through messages) may have nuanced impacts on well-being. Instagram has been shown to be beneficial in seeking information and support for mental health (Naslund et al., 2020), whilst influencers on Instagram may exhibit luxurious lifestyles in the way of exotic holidays and expensive dinners (Abidin, 2016). This in turn may lead to negative emotion in viewers who cannot lead the same lifestyle (Chae, 2017), indicating the need to further investigate how users engage with this platform to assess how they may affect their well-being.

In addition to active and passive patterns of SNS usage, there has also been growing concern regarding the problematic usage of SNS platforms. Problematic SNS use is generally characterized by a strong motivation to use SNS, excessive concern about using SNS, and devoting so much time to the use of SNS that it impairs aspects of day-to-day life, such as work and interpersonal relationships (Andreassen & Pallesen, 2014; Huang, 2020). In this regard, problematic usage is considered a maladaptive pattern of SNS use (Shensa et al., 2018) and has been associated with negative outcomes in both physical and mental health (Moqbel & Kock, 2018; Pontes, 2017). For instance, it has been posited that individuals who spend too much time thinking about SNS or have less face-to-face interactions due to spending too much time on SNS, can develop a pattern of escalated engagement on SNS and an increased pattern of repetitive visits, encouraging increased engagement with more self-evaluative behaviours online (Shensa et al., 2018). In turn, this may lead to anxiety and

depressive symptoms, in addition to negative self-image, due to lack of social support or self-efficacy whilst using SNS (Meier & Gray, 2015; Baturay & Toker, 2017; Elhai et al., 2017).

However, much literature on problematic SNS use has focussed on Facebook use (e.g., Turel & Qahri-Saremi, 2017; Biolcati et al., 2018; Jiang & Ngien, 2020), and therefore findings may not be generalizable to other platforms, such as Instagram, which include more photo-based content in comparison to Facebook, which is more text-centred and less likely to exaggerate and display positive appearances and life scenarios (Lup et al., 2015). Indeed, it has been indicated that specific features of Instagram (i.e., photos, videos and live streams) may contribute to problematic usage due to the motivation for different gratifications online, i.e., seeking certain content to fulfil needs, such as entertainment or social interaction (Whiting & Williams, 2013; Kircaburun & Griffiths, 2018). In turn, increased problematic Instagram usage may encourage self-evaluative behaviours on the platform, particularly due to its image-heavy environment, leading to increased levels of negative self-image, and symptoms of depression and anxiety. Moreover, it has been shown that interactive features (e.g., likes and comments) made on body image-based images can amplify the presence of certain photos, subsequently adding meaning and valence to appearance-based media (Rodgers, 2016; Kim, 2020), which can be associated with body image dissatisfaction, especially if self-evaluative behaviours are exacerbated through problematic usage (Santarossa & Woodruff, 2017; Aparicio et al., 2019). As such, this indicates that problematic usage patterns may have a negative impact on body image, anxiety and depression outcomes, highlighting the need for further research to examine problematic SNS use in the context of Instagram and well-being.

One factor that has been related strongly with body image dissatisfaction is appearance anxiety. Appearance anxiety has been strongly associated with measures of anxiety, however, is unique in its preoccupation with one's appearance and the fear of being negatively

evaluated by others for one's appearance (Hart et al., 2008). As a result, appearance anxiety has been highlighted to be associated with body image-based disorders, such as body dysmorphic disorder, anorexia nervosa and bulimia nervosa (Seekis et al., 2020). Responses to appearance concerns and distorted body image can include a number of cognitive processes, including appearance checking, comparing, or camouflaging perceived defects (Veale et al., 2014), which in turn can mediate changes in well-being outcomes and interference in day-to-day life. Indeed, evidence has shown appearance anxiety to influence outcomes of depression and self-esteem (McBain et al., 2013; Şahin et al., 2014). For instance, it has been suggested that in the context of appearance anxiety and depression, individuals with higher appearance anxiety are more likely to perceive elements of their environment as appearance-related and negative (Rosser et al., 2010; Gitimu et al., 2016). In turn, this may lead to rumination of appearance concerns, leading to higher levels of depressive symptoms (Fink et al., 2013).

The relationship between appearance anxiety and self-esteem has also been highlighted (Adams et al., 2017), whereby self-evaluative behaviours (such as negative self-statements) of appearance anxiety may play a role in lower levels of self-esteem (Jong et al., 2011; Antonietti et al., 2020). However, research that has investigated appearance anxiety has predominantly focussed on risk factors such as eating disorder behaviours (Gitimu et al., 2016), emotional regulation (Bender et al., 2012) and peer relationships (Webb & Zimmer-Gembeck, 2013). Whilst more recent research is beginning to investigate the associations between SNS use and appearance anxiety (e.g., Ayar et al., 2018; Boursier et al., 2020; González-Nuevo et al., 2021), it has focussed on time spent on SNS, rather than patterns of SNS engagement. Of note, there is one study that has investigated the link between problematic SNS use and symptoms of depression, appearance anxiety and social anxiety, with findings demonstrating both general and appearance-related SNS use as being positively

associated with depression, social anxiety, appearance anxiety, and appearance rejection sensitivity (Hawes et al., 2020). However, it did not investigate these variables in the context of passive or active SNS use. As such, there remains a paucity of research that examines the mediating role of appearance anxiety in relation to different SNS usage patterns and psychological well-being variables. That is, it has been indicated that appearance-based content can highlight to viewers types of appearances that are perceived as favourable or unfavourable by others (Rodgers, 2016). This may lead to preoccupation in appearance and an increase in appearance anxiety, resulting in higher levels of anxiety and depression as a result of concerns around appearance (Antonietti et al., 2020). Examining variables such as depression and anxiety in relation to appearance anxiety in the context of passive and active patterns of use can therefore provide insight into patterns of SNS engagement habits that may be maladaptive to psychological well-being (Hawes et al., 2020) and provide further understanding into the potential role of SNS in predicting appearance anxiety and negative effects of different SNS engagement.

In light of this, the present study aims to investigate the relationship between active, passive and problematic SNS usage on anxiety, depression and appearance anxiety outcomes, respectively. In particular, it seeks to investigate these outcomes in the context of Instagram use to provide insight into the influence Instagram use may have on users' well-being. The present study also aims to examine the mediating role of appearance anxiety in the relationship between Instagram usage and the selected well-being variables. As appearance anxiety has been associated with clinical populations of body image disorders (Seekis et al., 2020), this study was conducted to establish the influence of appearance anxiety on well-being outcomes within a non-clinical population. It is hypothesised that: i) passive and problematic Instagram use will predict higher levels of anxiety and depression, and lower levels of self-esteem, ii) active use will predict lower levels of anxiety and depression, and

higher levels of self-esteem and iii) passive and problematic Instagram use will be indirectly related to anxiety, depression and appearance anxiety through appearance anxiety.

6.2 Methods

6.2.1 Design

The present study used a cross-sectional design, whereby participants took part in an online questionnaire reporting their social media use and well-being. The predictor variables investigated were passive, active and problematic SNS use. The outcome variables examined were anxiety, depression and self-esteem. Appearance anxiety was included as a mediating variable.

6.2.2 Participants

Participants were recruited on a voluntary basis from Nottingham Trent University, as well as from online SNS platforms using the researcher's social network platforms (i.e., Instagram, Facebook, and Twitter). The study was advertised both online (via Twitter, Facebook and Instagram and an online student recruitment portal), and offline (via posters in university communal areas). Eligibility criteria included being (i) users of the SNS platform Instagram, (ii) at least 18 years of age, and (iii) able to understand the instructions implemented within the study and provide informed consent. If participants were psychology students at the university, they were credited with one SONA credit (i.e., research credit compensation for psychology students who participate in advertised studies) for their participation.

A total of 330 initial participants were recruited to take part in the study. Data were collected across a period of ten months (February to December 2020). Participants who completed 100% of the survey were included in the study. 40 participants were therefore excluded due to incomplete survey responses. This resulted in a final sample of 290 participants.

Participants were aged between 18-90 (*M*=21.5, *SD*= 5.34, modal age = 20) and consisted of 238 women and 52 men. All sample characteristics are presented in Table 6.1.

Table 6.1

Socio-demographics of participant sample

N	290
Gender (female, %)	238 (82.1)
Age (years) (mean, *SD*)	21.5 (5.34)
Country of Residence (n, %)	
United Kingdom	244 (84.14)
India	15 (5.17)
Isle of Man	10 (3.45)
United States	2 (0.69)
Spain	2 (0.69)
Germany	2 (0.69)
Romania	2 (0.69)
Other countries	13 (4.48)
Employment (n, %)	
Student (undergraduate and postgraduate)	226 (77.93)
Employed (full time and part time)	54 (18.62)
Unemployed	10 (18.62)

6.2.3 Psychometric Measures

6.2.3.1 Bergen Social Media Addiction Scale (BSMAS)

To assess problematic SNS use, the BSMAS was used (Andreassen et al., 2016). The BSMAS is a self-report instrument constructed of six questions based on Griffiths' addiction components (i.e., salience, tolerance, mood modification, relapse, withdrawal and conflict;

Griffiths, 2005) and assesses social media defined as “Facebook, Twitter, Instagram and the like” (Andreassen et al., 2016). Each item is scored on a 5-point Likert scale ranging from 1 (“very rarely”) to 5 (“very often”), with higher scores indicating a higher risk of problematic SNS use, and a BSMAS score of ≥ 19 determining an individual at-risk of problematic SNS use (Bányai et al., 2017). The BSMAS has been translated into several languages and has been shown to have acceptable psychometric properties across studies (Lin et al., 2017; Monacis et al., 2017; Yam et al., 2019), and good internal consistency (Cronbach’s alpha = .88; Monacis et al., 2017). The BSMAS is presented in Appendix V.

6.2.3.2 Appearance Anxiety Inventory (AAI)

The AAI assesses the cognitive processes (e.g., rumination, focussed attention) and safety seeking behaviours (e.g., camouflaging a perceived defect, avoiding people) that are attributed to a response to distorted body image and associated shame in BDD (Veale et al., 2014). It is a self-report instrument that consists of 10 items scored on a 5-point Likert scale ranging from 0 (“not at all”) to 4 (“all the time”), with higher scores indicating higher frequency of a process and higher symptom severity. The AAI has been shown to have good convergent validity and appearance-based rejection sensitivity (Roberts et al., 2018), in addition to good internal consistency (Cronbach’s alpha =.86; Veale et al., 2014). The AAI is presented in Appendix VI.

6.2.3.3 Hospital Anxiety and Depression Scale (HADS)

The HADS is a brief self-assessment tool designed to assess anxiety and depression in a non-psychiatric hospital setting (Breeman et al., 2015). The questionnaire is comprised of anxiety and depression subscales, which contain seven items that are scored separately (Stern, 2014). Each item is scored on a scale of 3 (most severe) to 0 (absence of problem in that area) (Doyle et al., 2006). Scores of 8 to 10 are suggestive of the presence of anxiety or depression, whilst a score of 11 or higher is indicative of a probable presence of the respective state

(Snaith, 2003). The HADS has been shown to have acceptable validity and good internal consistency (anxiety α=.82; depression α=.79; Lin & Pakpour, 2017). The HADS is presented in Appendix VII.

6.2.3.4 Rosenberg Self-Esteem Scale (RSES)

The RSES is a uni-dimensional ten-item scale of global self-esteem (Rosenberg, 1965). Examples of the statements include "on the whole, I am satisfied with myself" and "I take a positive attitude toward myself". All items are rated on a 4-point Likert scale ranging from 1 ("strongly disagree") to 4 ("strongly agree"), with higher scores indicating higher self-esteem. Specifically, scores of 0-20 are indicative of low self-esteem, 20-30 of normal levels of self-esteem, and scores of 30-40 are indicative of high self-esteem. The RSES has been shown to have acceptable validity and good internal consistency (α=0.77-0.88; Rosenberg, 1965; Wongpakaran & Wongpakaran, 2012). The RSES is presented in Appendix VIII.

6.2.3.5 Passive and Active Use Measure (PAUM)

The PAUM is a measure designed to assess passive and active SNS engagement (Gerson et al., 2017). Originally developed to assess types of engagement on Facebook, this measure was adapted for the present study to reflect activities associated with Instagram use, as opposed to Facebook use. The original PAUM consists of 13 items that capture the essence of active (social) use (e.g., posting status updates, chatting on FB chat), active non-social use (e.g., RSVPing to events) and passive use (e.g., viewing photos, browsing newsfeed passively). These items are scored on a 5-point Likert scale ranging from 1 ("never"; 0% of the time) to 5 ("very frequently"; 100% of the time). The PAUM for Facebook has been shown to have good discriminant validity and reliability (active social α=.80; active non-social α=.78; passive α=.70; Gerson et al., 2017). For the present study, two items were removed: "posting status updates" and "creating or RSVPing to events", as these are not functions found on Instagram generally. After these items were removed, a total of eleven

items remained. Seven of these items assessed active use and four items assessed passive use. The final measure was employed to identify the extent to which users used Instagram more actively or passively. The adapted PAUM is presented in Appendix IX.

6.3 Analysis plan

The following section outlines the approaches taken to data analysis in the present study. Firstly, descriptive statistics were used to assess the means and standard deviations of the scales, followed by correlation analyses to assess the relationships between the included variables. Factor analysis was then conducted to verify the factor structure of the scales used, whilst path analysis within structural equation modelling (SEM) was conducted to test the proposed mediation model. Assumptions for linearity, normality and multicollinearity were also checked. Statistical analyses were performed using RStudio. The 'psych' package was used for the descriptive and correlational analysis (Revelle, 2021), whilst the 'Lavaan' package was used to explore the models utilising factor analysis (Rosseel, 2012). To test the significance of indirect effects, bootstrapping was employed using the package 'boot' (Davidson & Hinkley, 1997).

6.3.1 Factor analysis

Confirmatory factor analysis (CFA) was conducted for all scales used within the present sample. CFA was primarily conducted as the psychometric properties and factor structure of all scales used within the present study have been previously validated. Thus, the CFAs conducted were based on a priori prediction from previous literature (Prudon, 2015). However, where model fit was suboptimal after performing CFA, exploratory factor analysis (EFA) was performed to further investigate the factor structures of the scales and explore the more complex patterns of the data within the present sample (Yong & Pearce, 2013). The expectancies of the CFA factor structure outcome for each scale are outlined below.

6.3.1.1 Appearance Anxiety Inventory (AAI): CFA

Two models were initially evaluated as the AAI has been shown to have a one-factor model and two-factor model for a general population and body dysmorphic population, respectively (Veale et al, 2014). Both one- and two-factor structures were evaluated. As this scale was used to assess appearance anxiety within a non-clinical population, it was expected to have a one-factor structure for the present sample.

6.3.1.2 Bergen Social Media Addiction Scale (BSMAS): CFA

For the present sample, a one factor model was tested to evaluate the BSMAS in accordance with the development of the scale and on the basis of the one-factor structure found in previous literature and to ensure content validity to reflect the six elements of social media addiction (Andreassen et al., 2012; Griffiths, 2005).

6.3.1.3 Hospital Anxiety and Depression Scale (HADS): CFA

A two-factor CFA model was examined based on previous literature (Michopoulos et al., 2008; Hung et al., 2015). Items associated with anxiety were expected to load onto one factor and items associated with depression were expected to load onto a second factor, remaining consistent with the two subscales of anxiety and depression of the HADS (Haugan & Drageset, 2014; Hung et al., 2015).

6.3.1.4 Passive and Active Use Measure (PAUM; Instagram): CFA

Two models were initially evaluated as the PAUM has been shown to have a two-factor and three-factor model (where a three-factor model distinguishes between active social and active non-social use). However, these factor structures were based on the Facebook version for which the PAUM was originally developed (Gerson et al., 2017). As the present study implemented a modified version of the PAUM for Instagram use, it has been suggested that features distinguishing active-social/active non-social Facebook usage may not be explicit to

the features of Instagram or the ways in which users interact with Instagram (Trifiro & Gerson, 2019). It was expected that the items related to active-social/active non-social usage would not be distinct in regard to active Instagram usage, and that the PAUM would have a two-factor structure (active and passive use) within the present study.

6.3.1.5 Rosenberg Self-Esteem Scale (RSES): CFA

Two models were initially evaluated as the RSES has been shown to have both a one-factor and two-factor structure (where the two-factor model distinguishes positively and negatively worded items; Boduszek et al., 2013). It was expected that the two-factor structure would be a better fit to the current data, as it has been shown that a two-factor structure is a superior representation of the positive and negative aspects of self-esteem in comparison to a one-dimensional structure. In addition, a two-factor structure has been demonstrated to be appropriate within adult populations, as sampled in the present study (Hyland et al., 2014).

6.3.2 Path analysis

In accordance with path analysis, the variables included in the mediation model were treated as observed variables (Sarstedt & Ringle, 2020). Whilst it has been argued that latent variable models in mediation are beneficial in adjusting for measurement errors in the measured variables, they can also be prone to overestimating or underestimating parameter values in comparison to observed variable models (Ledgerwood & Shrout, 2011). By using path analysis to explain the causal relationships among variables, this allows for the total effect, indirect and direct effects to be investigated, thus enhancing the interpretation of relations, in addition to the pattern of effects between variables (Jeon, 2015). Thus, path analysis was chosen as a suitable method as it can enable both the indirect and direct effects to be examined more specifically in relation to the independent and dependent variables of the study (Instagram use and well-being, respectively), in addition to investigating the mediating role of appearance anxiety (Fan et al., 2016).

The goodness of fit for the SEM analysis conducted within the present study was evaluated using the Comparative Fit Index (CFI), the Tucker-Lewis Fit Index (TLI), Root Mean Square Error of Approximation (RMSEA). Models were considered an acceptable fit with CFI and TLI values of ≥0.95 and a RMSEA of ≤0.08 (Cangur & Ercan, 2015).

6.4 Results

6.4.1 Descriptive statistics

The results indicate that on average, participants scored within the normal ranges, based on the cut-off criteria for each of the scales, with the exception of anxiety. Using the cut-off criteria suggested for the HADS anxiety subscale (whereby scores of 8-10 are suggestive of the presence of anxiety or depression), this indicated the presence of anxiety symptomatology within participants in the present sample. Means and standard deviations of scores are presented in Table 6.2.

Table 6.2

Means and standard deviations of participant scores

***N* = 290**	**α**	**Mean**	***SD***
Anxiety	.89	8.11	4.42
Depression	.89	5.48	3.94
Self-Esteem	.90	26.66	2.31
Appearance Anxiety	.91	13.61	8.68
SNS Addiction	.80	16.60	4.95
Active SNS	.79	16.17	4.24
Passive SNS	.79	14.41	2.98

6.4.2 CFA and EFA of scales

6.4.2.1 Appearance Anxiety Inventory: CFA / EFA

Both the one-factor and two-factor models without modification showed poor fit with the data. The RMSEA for both models were above the critical value of ≤0.06 (RMSEA = 0.12). The CFI and TLI also indicated inadequate fit, according to the critical value of ≥0.95 (model one, CFI= 0.91, TLI = 0.89; model two, CFI = 0.92, TLI = 0.89).

A one-dimensional structure was therefore examined, with the removal of item 2, based on previous literature of the scale within a general population (Veale et al., 2014). In addition, items 5'*I think about how to camouflage or alter my appearance'* and 9 '*I try to camouflage or alter aspects of my appearance*' were allowed to correlate on the basis of modification indices (.37). That is, the preoccupation that dominates behaviour of camouflaging appearance (corresponding with item 5 - 'I think about how to camouflage or alter my appearance') could be related to increased activity needed to be reassured about perceived flaw in appearance (subsumed in item 9 'I try to camouflage or alter aspects of my appearance') (Grant & Phillips, 2005; Summers & Cougle, 2018). This model provided the best fit to the data (CFI= .96, TLI= .94 RMSEA= .09), Cronbach's alpha =.91.

6.4.2.2 Bergen Social Media Addiction Scale: CFA/EFA

A one-factor model was used to evaluate the BSMAS. However, this one-dimensional model without modification showed poor fit with the data (RMSEA = 0.12, CFI = 0.92, TFI = 0.87). To explore this further, an EFA was conducted. The one-dimensional scale was re-modified by allowing item 1 *'spent a lot of time thinking about social media or planned use of social media'*, and item 2 *'felt an urge to use social media more and more'* to correlate on the basis of modification indices (.31). According to previous literature, item 1 can be theoretically related to item 2 in that the preoccupation corresponding with the salience criterion (item 1) can be related to the increased activity needed to achieve satisfaction of using SNS, which is

subsumed in item 2 (tolerance criterion) (Monacis et al., 2017). This solution resulted in an excellent fit to the data (CFI= .98, TLI=.97, RMSEA= .06), Cronbach's alpha =.80.

6.4.2.3 Hospital Anxiety and Depression Scale: CFA

A two-factor CFA model was examined, consistent with the two subscales of anxiety and depression of the HADS. This model had a moderate fit to the data (CFI= 0.94, TLI= 0.93, RMSEA= 0.07), Cronbach's alpha= .89.

6.4.2.4 Passive and Active Use Measure (Instagram): CFA/EFA

Both the two-factor and three-factor models without modification showed poor fit with the data. The RMSEA was above the critical value of ≤0.06 (RMSEA = 0.13 for both models). The CFI and TLI also indicated a poor fit (CFI = 0.81, TLI = 0.75 for both models).

Due to this, the model was re-evaluated, removing item 8 and reducing the factor structure down to two. Item 8 was removed on the basis that it did not load onto a factor in the three-factor solution, as well as on the premise that photos are interacted with more in comparison to videos on Instagram (Hu et al., 2014). This solution provided the best fit for the data (CFI=.95, TLI =.93, RMSEA= .07), Cronbach's alpha = .79).

6.4.2.5 Rosenberg Self-Esteem Scale: CFA

The one-factor model did not fit the data well (CFI= 0.90, TLI= 0.87, RMSEA=0.117). The second, two-factor structure model provided a better fit to the data, although the RMSEA was marginally higher than the recommended cut-off (CFI= 0.94, TLI= 0.91, RMSEA= 0.09), Cronbach's alpha = .90. These results were considered acceptable due to the RSES being a widely validated scale (Martín-Albo et al., 2007; Galanou et al., 2014; Park & Park, 2019).

6.4.3 Correlation analyses

Associations between well-being variables in the present sample ranged from weak to strong. Correlations varied between the lowest (r=0.01) for self-esteem and appearance anxiety and the highest (r=0.60) for anxiety and depression, supporting their conceptual relatedness (Norton et al., 2013). For Instagram use variables, correlations varied between the lowest (0.31) between problematic use and passive use, and highest (0.47) for active use and passive use. Moderate correlations were found between Instagram addiction and anxiety (0.30) and Instagram addiction and appearance anxiety (0.40). A correlation matrix is presented in Table 6.3.

Table 6.3

Correlation matrix between well-being and Instagram use variables

	Anxiety	Depression	Self-Esteem	Appearance Anxiety	SNS Addiction	Active SNS	Passive SNS
Anxiety	1.00						
Depression	0.60**	1.00					
Self-Esteem	0.15*	-0.02	1.00				
Appearance Anxiety	0.45**	0.44**	0.01	1.00			
SNS Addiction	0.30**	0.26**	0.06	0.40**	1.00		
Active SNS	0.06*	-0.12*	0.04	0.12*	0.36**	1.00	
Passive SNS	0.12*	-0.04	0.11	0.25**	0.31**	0.47**	1.00

*p <.05 **p<.001

6.4.4 Mediation models

Mediation analysis was conducted using the bias-corrected bootstrap test of mediation, based on 1000 samples. Whilst it has been indicated that the bias-corrected bootstrap test may be liable to elevated Type I error rates, it has also been shown to have the highest statistical power and is widely recommended for use within mediation analysis (Fritz & MacKinnon,

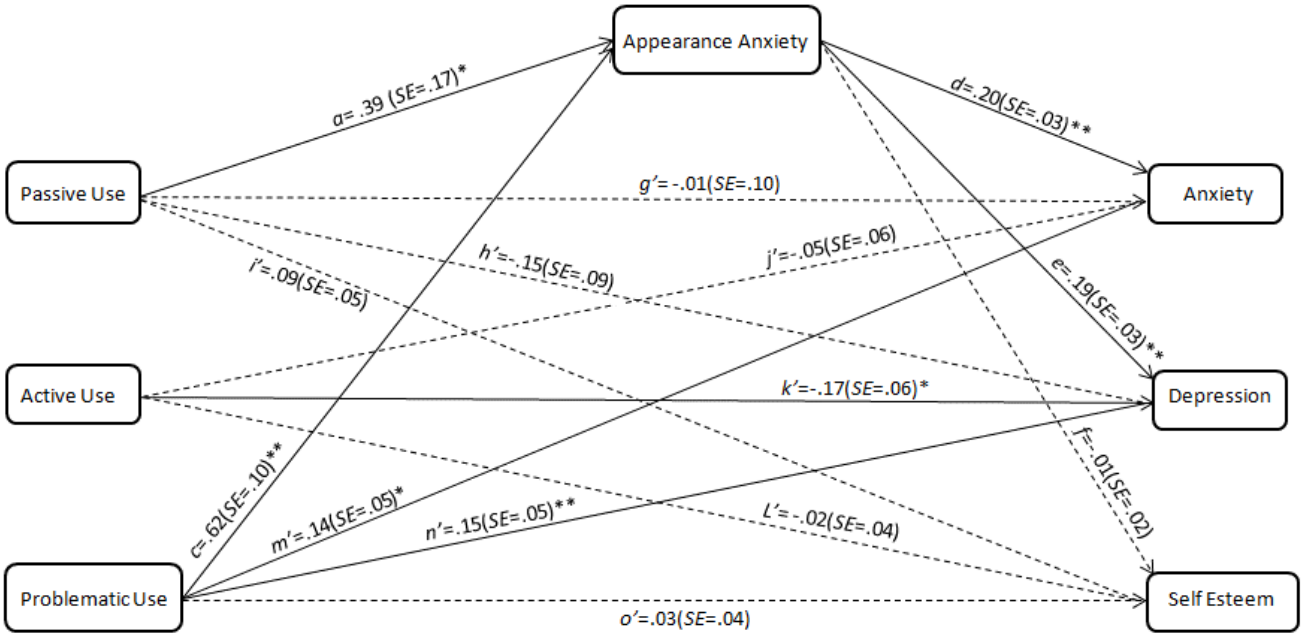
2010). Figure 6.1 shows the model tested in the present study. To assess the fit of the proposed model to the data, this model was compared to a null model, where all paths were assumed as zero. The proposed model fit the data well (RMSEA=.07, CFI = 1.0, TLI= .92, X^2= 2.26, *df*= 1), in comparison to the null model (RMSEA=.38, CFI = .00, TLI= -.00, X^2= 120.24, *df*= 3).

Mediation analysis found that appearance anxiety was a significant mediator between passive use and anxiety (*ad* =.08 (*SE* = .04); *p* < .05; 95% CI: .01, .17), problematic use and anxiety (*cd* = .13 (*SE* = .03); *p* <.001; 95% CI: .07, .18), passive use and depression (*ae* = .07 (*SE* = .04); *p*< .05; 95% CI: .01, .15) and problematic use and depression (*ce* = .12 (*SE* = .03); *p*<.001; 95% CI: .07, .18). However, appearance anxiety was found to be a non-significant mediating variable for passive use and self-esteem (*af* = -.004 (*SE* = .01) *p* >.05; 95% CI: -.02, .01), as well as for problematic use and self-esteem (*cf* = -.01 (*SE* = .01) *p* >.05; 95% CI: -.03, .01).

Significant direct effects were also found between problematic use and anxiety (*m'* = .14 (*SE* = .05) *p*<.05; 95% CI: .04, .25), problematic use and depression (*n'* = .15 (*SE* = .05) *p* = .001; 95% CI: .06, .25), and active use and depression (*k'* = -.17 (*SE* = .06) *p*< .05; 95% CI: -.28, -.06). On the other hand, there was a non-significant direct effect between passive use with anxiety (*g'* = -.01 (*SE* = .10) *p* > .05; 95% CI: -.19, .20), depression (*h'* = -.15 (*SE* = .09) *p* > .05; 95% CI: -.32, .03) and self-esteem (*i'* = .09 (*SE* = .05) *p* > .05; 95% CI: -.01, .17). There was also a non-significant effect between active use with anxiety (*j'* = -.05 (*SE*= .06) *p* >.05; 95% CI: -.17, .07) and self-esteem (*L'* = -.02 (*SE* = .04) *p* >.05; 95% CI: -.10, .06). A non-significant direct effect was also found for problematic use and self-esteem (*o'* = .03 (*SE* = .04) *p* > .05; 95% CI: -.05, .10).

Figure 6.1

Mediation model showing the direct and indirect pathways tested



Note. Standardized regression coefficients are detailed. *p<.05, **≤.001. Dashed arrows: non-significant pathways.

6.5 Discussion

The present study aimed to investigate the relationship between active, passive and problematic SNS usage on anxiety, depression and self-esteem outcomes, and the mediating role of appearance anxiety in the relationship between Instagram usage and the selected well-being variables. It was hypothesised that: i) passive and problematic Instagram use would predict higher levels of anxiety and depression, and lower levels of self-esteem, ii) active use will predict lower levels of anxiety and depression, and higher levels of self-esteem and iii) passive and problematic Instagram use will be indirectly related to anxiety, depression and self-esteem through appearance anxiety. The results of the present study revealed direct

effects between problematic use on anxiety and depression, in addition to active SNS use and depression. It was also revealed that appearance anxiety was a significant mediator for passive use on anxiety and depression, and problematic use on anxiety and depression. The direct effects between passive use on anxiety, depression or self-esteem, active use on anxiety or self-esteem and problematic use and self-esteem were not significant. As a result, the findings of the present study provide partial support for the hypotheses presented.

Consistent with prior research, it was found that problematic Instagram usage predicted anxiety and depression symptomatology (Donnelly & Kuss, 2016; Lozano Blasco et al., 2020). Indeed, the escalated pattern of engagement with problematic usage can lead to less face-to-face interpersonal interactions (Shensa et al., 2018), which in turn can lead to perceived lack of social support and self-efficacy (Elhai et al., 2017; Baturay & Toker, 2017). More specifically, individuals displaying depressive symptoms are more likely to have less personal control in daily interactions and tend to be more socially isolated, and therefore may use Instagram as a way to compensate for the lack of interpersonal relationships by seeking connections online (Hong et al., 2014). On the other hand, those with anxiety may compensate for feelings of shyness and poor face-to-face communication by turning to an Instagram environment for support (Naslund et al., 2014). Indeed, this may be consistent with the theory of social compensation, which posits that individuals who are socially anxious are more likely to use and engage with SNS as a way to compensate for their unsatisfactory offline interactions (McKenna et al., 2002; Bergagna & Tartaglia, 2018). However, using an online environment for support may increase avoidance of face-to-face interaction and subsequently perpetuate symptoms of anxiety (Indian & Grieve, 2014). As such, the effect of problematic usage on both anxiety and depression observed within the present study may be accounted for by the lack of self-efficacy and/ or support in face-to-face interaction as a result

of problematic engagement (Meier & Gray, 2015), indicating problematic Instagram usage as a potential risk factor for anxiety and depressive symptoms.

On the other hand, problematic Instagram use did not predict self-esteem in the present findings. Contrary to previous research, which has suggested that problematic SNS use leads to lower self-esteem as a result of self-evaluative behaviour online in comparison to others' content (Baturay & Toker, 2017; Elhai et al., 2017), the present findings may reflect problematic usage that is self-oriented in nature, i.e., consisting of a user's original posts and images (Steinsbekk et al., 2021). It has been shown that self-oriented SNS may boost self-esteem for two main reasons: i) content posted of oneself often presents a self-selected, 'best version' of the self, and when users post this version, it becomes integrated in the way they perceive themselves (Gonzales & Hancock, 2008), and ii) users who post their own content are more likely to receive positive feedback, thus increasing self-esteem (Valkenburg et al., 2017; Steinsbekk et al., 2021). This may be explained from a sociometer perspective, whereby self-esteem is gauged through cues of rejection or inclusion from the social environment; thus, the way individuals feel about themselves is a dynamic gauge of their relational value (Leary, 2005). Therefore, within the present study, individuals displaying problematic SNS may take a self-oriented approach in their usage, subsequently leading to higher self-esteem due to positive feedback and impression-formation of self (Gonzales & Hancock, 2011). However, self-oriented SNS use has been shown to increase appearance-related self-esteem rather than global self-esteem, which was measured in the present study. Whilst global self-esteem is strongly related to psychological well-being outcomes (Rosenberg et al., 1995), assessing specific self-esteem (such as appearance self-esteem) can provide more insight into satisfaction with body perception to reflect the extent to which individuals are satisfied with their physical appearance (Noser & Zeigler-Hill, 2014). In future research, this may be beneficial in assessing the role of Instagram usage and

appearance self-esteem in body image-based disorders, such as body dysmorphic disorder (BDD), whereby self-worth is based on the value in appearance (Baldock & Veale, 2018), providing further understanding regarding the role of Instagram usage on self-esteem outcomes.

Findings also revealed a significant negative direct effect of active Instagram use on depression, consistent with previous research that has indicated active use leading to lower depressive symptoms (Frison & Eggermont, 2016). It has been suggested that the direct communication from active usage can promote feelings of social connectedness, which in turn can lead to greater feelings of belonging through expansion networks and maintenance of relationships with peers (Tazghini & Siedlecki, 2013; Veruyn et al., 2017). That is, active usage, such as direct messaging on SNS platforms, can reflect more intimate exchanges, in which users find it easier to share personal feelings (Davis, 2012). In turn, this can lead to increased perceived support which may fulfil a protective role in depressive symptoms (Seabrook et al., 2016). The present findings suggest users using Instagram actively for direct communication feel more supported through their online networks, resulting in lower levels of depression.

Conversely, there were no direct effects between active use on anxiety or self-esteem. Similarly to depression, active use has been suggested to fulfil a protective role to anxiety and self-esteem through perceived social support online (Indian & Grieve, 2014), however this was not found in the present study. This may be explained by the type of active activity users engage with on Instagram. That is, it has been shown that active use through direct communication may be beneficial for well-being outcomes, however there is evidence to show that active use through 'broadcasting' content (i.e., actively posting on SNS without the content being directed to specific individuals) may be related to negative well-being (Yang, 2016). Indeed, by broadcasting content, users mitigate direct communication with their

networks and thus failing to receive responses or feedback from their followers (e.g., through comments on content posted) may lead to feeling unsupported (Yang, 2016). The nature of Instagram can involve the posting of content to non-specific users (Sheldon & Byant, 2016), suggesting that the effects found within the present study may be dependent on the quality of feedback received on content posted on Instagram if users are active 'broadcasters' on the platform. Nevertheless, this highlights that the notion of active SNS usage is complex, and indicates that there are nuances in the interactivity of Instagram that need to be explored further in light of psychological well-being, such as anxiety and self-esteem.

Moreover, the results of the present study found no direct effects between passive use on anxiety, depression or self-esteem. These findings add to recent literature that has shown that passive use may not necessarily be detrimental to well-being (Beyens et al., 2020). That is, whilst passive usage mainly consists of browsing, users may seek positive content, leading to feelings of support or enjoyment (Radovic et al., 2017). In addition, browsing content can also be beneficial in seeking information and support for mental health, which can lead to feelings of support (Naslund et al., 2020). Indeed, it has been shown that motives for Instagram usage tend to encompass both entertainment and information-seeking (Sheldon & Bryant, 2016; Alhabash & Ma, 2017), which may be reflective of the main motives of the present study's sample. This is consistent with the Uses and Gratifications (U&G) theory, which assumes that SNS users are aware of their interests and motives, which help them in their media selection (Katz 1959; Alhabash & Ma, 2017), and thus highlights the importance of further understanding the motivations of using Instagram passively, as it is likely that users seek certain content to gratify certain needs (e.g., enjoyment or support). Therefore, it may be that 'passive use' is too broad a term to capture different types of browsing and rather, a focus on more specific content consumption would be beneficial in future research to further

understand the facets of ‘passive’ use, and both the detrimental and beneficial outcomes these types have on well-being (Yang, 2016).

Findings from the path model revealed that problematic and passive Instagram use indirectly predicted both depression and anxiety via appearance anxiety. This indicates that appearance anxiety may play an important role in linking passive and problematic usage with psychological well-being outcomes, particularly as no direct effect was found between passive use and the well-being outcomes in the present study. One explanation for this is that the information gained by using Instagram passively and problematically may increase the number of negative comparisons users engage with online (Donnelly & Kuss, 2016). This may be further understood in the context of self-objectification theory, which posits that individuals may perceive their bodies as objects, evaluated by others on the basis of bodily appearance (Calogero, 2012; Holland & Tiggemann, 2016), and suggests that repeated experiences of objectification can facilitate these individuals to internalise a third person’s perspective on themselves (Boursier et al., 2020). As a result, this self-objectification may be manifested through habitual body surveillance (Feltman & Szymanski, 2017). In the context of Instagram, when users engage in passive or problematic browsing, it is likely that content portraying appearance ideals is viewed, and in addition to the interactive element of likes and comments within the platform, this can indicate to users the type of appearances that are seen as favourable or unfavourable by others (Rodgers, 2016; Kim, 2020). Thus, if users compare themselves on Instagram, they may take an observer’s perspective of themselves and engage in body surveillance as a way to see how their appearance measures up to appearance content online (Feltman & Szymanski, 2017). This may lead to a preoccupation in appearance and increased levels of appearance anxiety as users perceive their environment (in this case, the online Instagram environment), as negative and appearance related (Gitimu et al., 2016). The subsequent self-evaluative behaviours and rumination of appearance concerns within

appearance anxiety can lead to higher levels of depression and anxiety as a result of these maladaptive cognitions (Fink et al., 2013; Antonietti et al., 2020), which may account for the findings within the present sample. However, the present study did not investigate appearance comparisons or self-objectification specifically, and therefore further research including these potential underlying mechanisms is needed to determine the relationship between comparisons, self-objectification, Instagram use and well-being.

On the other hand, appearance anxiety was found not to be a mediator between problematic or passive use and self-esteem. Within the present sample, this may be explained by the utilisation of coping mechanisms by Instagram users. In particular, emotion-focussed coping, which aims to manage the emotional distress of the situation (e.g., through avoidance or distraction; Baker & Berenbaum, 2007) has been associated with the use of problematic SNS usage (McNicol & Thorsteinsson, 2017), with evidence demonstrating problematic users as more likely to utilise avoidance and emotion-focused coping in comparison to non-problematic users (Li et al., 2010). However, this type of coping strategy is generally seen as a maladaptive form of coping, and as a result, has been shown to lead to poorer self-esteem, whereas problem-focussed coping has been indicated to influence higher self-esteem, as individuals are dealing with issues constructively (Cong et al., 2019). This suggests that in the present study, users who experienced appearance anxiety through either problematic or passive use may have engaged in active coping strategies to mitigate feelings of appearance anxiety, as a result increasing self-esteem due to being able to alleviate these symptoms. However, it has been argued emotion-focussed coping may be beneficial regarding modulating emotions that are involved in feelings of appearance anxiety (Antonietti et al., 2020). Thus, further research is needed to understand the role of coping strategies within the context of Instagram use and appearance anxiety. Nevertheless, this suggests that coping strategies may play a protective role in Instagram well-being outcomes, and may be a

beneficial factor in mitigating negative well-being in the context of problematic or passive Instagram use.

6.5.1 Implications

Results from the present study can contribute to informing SNS initiatives targeting body image and/or well-being concerns. For instance, initiatives can be expanded to address content consumption online, and highlight the potential effects that Instagram interactive metrics (such as likes and comments on content) may have on appearance evaluations, for example, the impact of likes and comments on appearance self-worth. Moreover, the present findings suggest that educational initiatives should also address the value placed on appearance by emphasising the potential detrimental outcomes (e.g., anxiety, depression, or the manifestation of body image-based disorders) and how Instagram content may amplify this through the importance placed on likes and comments on appearance-based content.

The current findings can also have clinical implications. By understanding the different patterns of Instagram engagement, professionals can target the mechanisms that may perpetuate the associations between usage patterns and well-being outcomes, e.g., encouraging clients to critically think about the Instagram content they interact with, follow, and consume (Seekis, Bradley & Duffy, 2020). In light of this however, it would be beneficial for future research to establish the extent to which Instagram usage patterns may play a role in exacerbating symptoms of body image disorder symptoms (e.g., appearance anxiety in body dysmorphic disorder or anorexia) and the extent to which this may make users vulnerable to the clinical manifestation of body image disorders.

6.5.2 Limitations and future directions

One limitation of this study was the use of the PAUM (Gerson et al., 2017), which was chosen to measure levels of passive and active Instagram use. These categories may be too

broad to establish nuances in terms of content consumption and interactivity type on Instagram. Indeed, conducting factor analysis within the present study highlighted that the factor loadings of the scale items were not all distinct from one another. That is, both active and passive use are not mutually inclusive of each other (e.g., a user may go onto Instagram to browse content but also to message peers, rather than either one or the other respectively), and therefore it would be beneficial for future research to explore the specific and potentially overlapping facets of these usage patterns to establish Instagram engagement more effectively. Second, the present study only assessed appearance anxiety, without assessing potential mechanisms that may further underlie the relationship between Instagram usage and appearance anxiety, such as comparison processes or self-objectification. Prior research has highlighted the role of appearance comparisons in body image and maladaptive appearance cognitions (Ridolfi et al., 2011). Thus, future research should examine the influence of comparisons in the context of usage patterns, appearance anxiety and well-being outcomes to further examine the impact of Instagram use patterns. Lastly, data collection for this study took part during the COVID-19 outbreak, and it has been shown that this has had impacts on both SNS use and psychological well-being (Pan et al., 2021; Zhao & Zhou, 2021). More specifically, recent research has demonstrated COVID-19 to have led to higher levels of anxiety, stress, and depression (Gasteiger et al., 2021) which may have been reflected in the higher levels of anxiety within the present study.

6.6 Conclusion

The findings of the present study have shown problematic and passive Instagram use to have negative impacts in regard to anxiety and depression symptomatology. In addition, findings highlight the role of appearance anxiety on well-being outcomes. Understanding the nuances of Instagram patterns of engagement can contribute to providing better understanding of the underlying mechanisms associated with Instagram usage and well-being. In turn, this can

provide insight into the ways body image and clinical interventions are developed and targeted to educate Instagram users, and to inform how individuals can mitigate the potential impacts of Instagram engagement.

CHAPTER 7

Investigating Instagram engagement through 'DiaryMood': An application-based study employing ecological momentary assessment and passive objective monitoring

The empirical study presented in this chapter investigates objective Instagram behavioural patterns on well-being outcomes. The two previous empirical studies highlighted how certain types of Instagram features and engagement can contribute towards well-being and body image. The study presented within this chapter, however, builds upon these by observing specific functions (such as notifications) of Instagram that may contribute to well-being outcomes. The functionalities of Instagram observed within the present chapter were informed by the recommendations made in Chapter 3.

7.1 Introduction

Objective smartphone-based assessments can enable the monitoring of user behaviour in real time, providing information of SNS usage behaviours and well-being as they naturally occur (Trull et al., 2014). This method of data collection can be beneficial since much research into the area of SNS and well-being has focussed on the use of self-report measures to quantify experiences with technology (Ellis, 2019). Self-report cannot assess unconscious and naturally changing behaviours, making it likely to miss automatic processes related to SNS use (e.g., checking notifications), which may be conceptually related to outcomes in SNS usage and well-being (Bentley et al., 2018; Ellis et al., 2018). Objective monitoring, however, can minimise retrospective biases that may distort recollections of SNS behaviour, and allow for patterns of behaviour to be inferred (Trull et al., 2014; Bentley et al., 2018). Thus, research is beginning to develop and employ real-time monitoring to contribute towards assessing SNS user behaviour in real time.

SNS use has been linked to different outcomes in well-being. For example, research investigating the association between SNS and mood has found positive associations between time spent on SNS and depressive symptoms (Pantic et al., 2012). In addition, there is evidence to show that more frequent use of SNS is negatively associated with levels of self-esteem (Vogel et al., 2014; Donelly & Kuss, 2016). As discussed in Chapter 5, this may be attributed to the type of content users are viewing, particularly if users are encountering images of others displaying attractive presentations of themselves (Lup et al., 2015; Weinstein, 2017), as this can lead to increased self-evaluation and social comparisons (Donnelly & Kuss, 2016). Thus, it has been proposed that individuals who use SNS more frequently are more likely to be exposed to content that encourages self-evaluation and comparisons (Vogel et al., 2014), thus leading to lower levels of well-being outcomes such as mood and self-esteem.

In addition to content viewed on SNS, it has been shown that notifications received from SNS platforms may be associated with negative mood (Kanjo et al., 2017). Notifications may have a negative effect on SNS user well-being due to increasing social overload (Chai et al., 2019). The concept of social overload describes a situation wherein an individual perceives they are giving too much social support to others within their SNS social network (Maier et al., 2015). Indeed, SNS provide a useful environment to establish, maintain and expand social networks (Su & Chan, 2017), which not only facilitates the reception of perceived social support, but also the request of others for social support, which can contribute to the development of social overload (Chai et al., 2019). This has been shown to lead to feelings of exhaustion and low levels of user satisfaction (Maier et al., 2015). Thus, notifications may be associated with the request of others for social support via SNS, leading to decreased levels of well-being in SNS users.

It has also been demonstrated that negative emotional responses, such as feelings of stress and pressure to respond to notifications, are associated with notifications received (Pielot et al., 2014; Kanjo et al., 2017). This may be attributed to the fear of missing out (FOMO), which encompasses the preoccupation of SNS users who are unable to connect and communicate with others to the extent that they wish to (Alutaybi et al., 2020). Indeed, research has found that FOMO has been associated with higher levels of stress, in addition to decreased levels of psychological well-being (Beyens et al., 2016; Buglass et al., 2017), and this may be attributed to individuals becoming trapped in a "self-regulatory limbo" (Przybylski et al., 2013). That is, users enter a cyclical pattern of behaviour in which they seek to develop social relationships with others by increasing the amount of time online, but this in turn furthers FOMO, the vulnerability to engage in behaviours to mitigate the fear of missing interactions (e.g., checking messages, self-disclosing). In particular, craving to use SNS may be one outcome associated with receiving notifications. Craving is defined as the urge to consume or be involved in a type of behaviour (Brand et al., 2016), and is one of the six components in the model of addictive behaviours (Griffiths, 2005; see Chapter 3 for discussion). It has been indicated that many individuals with behavioural addictions report a craving state prior to initiating the behaviour, often leading to a positive mood state and decrease in anxiety once the behaviour has been executed, similar to those with substance use disorders (Grant et al., 2011). In the context of SNS, craving to use SNS to stay connected (De-Sola et al., 2017) may drive users to check their Instagram, ultimately decreasing psychological well-being if they become trapped in a cyclical pattern of checking (Buglass et al., 2017). As such, notifications may serve to exacerbate these behaviours as they play an essential role in supporting immediacy of attention (Pielot et al., 2014), and may worsen fear around missing timely interactions with others or of engaging in continuous, untimed interactions (Alutaybi et al., 2020).

In light of this, there has been growing concern around the concept of problematic SNS use in the context of well-being (Pontes, 2017; Moqbel & Kock, 2018). As discussed in Chapter 6, problematic SNS use is characterised by excessive concern about using SNS, a strong motivation to use SNS, and devoting so much time to the use of SNS that it impairs other social activities, work, interpersonal relationships and psychological health and well-being (Andreassen & Pallesen, 2014), reflecting the components of behavioural addiction as outlined by Griffiths (2005). Given this, users who express problematic SNS behaviours are likely to develop an increased pattern of repetitive visits to SNS platforms, increasing the engagement with self-evaluative behaviours online (Shensa et al., 2018). This can lead to depressive symptoms and lower levels of self-esteem due to lack of self-efficacy of social support whilst online (Kircaburun, 2016; Baturay & Toker, 2017; Elhai et al., 2017).

In addition to this, the notion of habitual usage is often employed to explain problematic SNS behaviour (Anshari et al., 2016; Lee et al., 2017), whereby habitual use is influenced by the frequency of behaviours, such as checking SNS (Neal et al., 2012). Indeed, it has been shown that habitual usage is an important contributor to problematic smartphone behaviour (van Deursen et al., 2015). In particular, checking habits, such as quickly launching SNS to check the platform or opening the standby screen, may be indicative of absent-minded use (Oulasvirta et al., 2011), and it has been posited that such habits can cause unintended behaviours that can be activated by internal (e.g., emotional state) or external (e.g., situational) cues (van Deursen et al., 2015). Notifications in particular may serve as a cue and reinforce checking behaviours by acting as a request for user attention, and can provide context into how often a user can be expected to check their phone to attend to the notification (Ellis et al., 2019). This indicates that notifications may increase the frequency of SNS use, increasing the likelihood of repetitive visits to SNS platforms and the potential for lower well-being outcomes.

However, many studies that have investigated the role of SNS use on well-being are predominantly cross-sectional in nature, and rely on measures of screen time as the index of SNS engagement (Odgers & Jensen, 2020). This is problematic for several reasons. Firstly, screen time is typically measured through self-report measures, relying on estimations between the number of minutes or hours participants spend on a typical day, or in a week (Kaye et al., 2020), and is thus retrospective in nature. It has been indicated that users are more prone to inaccurate recall when attempting to estimate behaviours that are integrated into their daily lives (Kahn et al., 2014), which can result in distorted time perception by the user, introducing recall bias in time usage estimates (Lin et al., 2015; Odgers & Jensen, 2020). Secondly, it has been shown that current self-report measures do not correlate or predict simple objectively measured behaviours (Ellis, 2019), and oftentimes, participants overreport the frequency of their usage (Boase & Ling, 2013). Self-report measures for both SNS usage and well-being are also often unable to capture unconscious and dynamically occurring changes in symptoms or behaviours (Bentley et al., 2018; Doherty et al, 2020). Given this, retrospective measures on both SNS usage and well-being can be inaccurate (Scharkow, 2016; Araujo et al., 2017), and as a result may lead to inflated correlations with outcomes regarding SNS use and psychological well-being (Kobayashi & Boase, 2012; Sewall et al., 2020).

Ecological momentary assessment (EMA) on the other hand involves sampling participants' current behaviours and experiences in real time within their natural setting and schedules (Bennett et al., 2020). This provides information on behaviours of interest as they occur naturally, minimising the retrospective biases that may distort recollections of behaviour, and increasing ecological validity within research (Trull & Edner-Priemer, 2014; Bentley et al., 2018). In particular, smartphone-based EMA, which allow data to be collected directly through smartphone devices, is becoming increasingly implemented within research due to

the widespread use of smartphones worldwide (de Vries et al., 2021). Due to these advantages, research has begun to employ the use of EMA within the context of SNS and well-being. For instance, a study by Bennett et al. (2020) employed smartphone-based EMA across a period of six days to investigate SNS consumption on mood and body dissatisfaction. It was found that time spent using SNS predicted negative affect, whereas the number of SNS visited predicted both negative affect and body dissatisfaction (Bennett et al., 2020). Another study employed the use of smartphone-based EMA across seven days to investigate the influence of body positivity on well-being and body image, with findings revealing body positivity content being associated with increased well-being and positive body image (Stevens & Griffiths, 2020). However, each of these studies still relied on participants' self-report for time spent on the internet (Bennett et al., 2020) and the number of exposures to SNS platforms (Stevens & Griffiths, 2020), which may have been subject to social desirability. In addition, reports of screen time and exposure to SNS platforms via EMA may be prone to reactivity effects, whereby participants' behaviours change throughout the duration of data collection due to their self-assessment of behaviour (Bennett et al., 2020; Doherty et al, 2020).

Passive objective monitoring collects data unobtrusively, without active data entry by the participant (Asselbergs et al., 2016; Bentley et al., 2018). As discussed in Chapter 3, data that involve smartphone usage patterns, such as screen time, and SNS activity can be collected, which can be beneficial in monitoring proxies of psychological well-being, such as behavioural patterns and contextual triggers (Asselbergs et al., 2016). Indeed, research investigating problematic smartphone use (PSU), depression, anxiety and daily depressive mood, utilised passive objective monitoring through the use of a smartphone application across one week to track screen time and the number of screen unlocks (Rozgonjuk et al., 2018). Findings revealed that PSU was related to screen time minutes, whilst depression and

anxiety was related to phone screen unlocking (Rozjonuk et al., 2018). Moreover, it was highlighted that distinguishing between screen time and phone unlocks can provide different insights into psychopathology, rather than just screen time alone (Rozjonuk et al., 2018). Another study utilising passive objective monitoring found that affective states can be predicted through the assessment of notifications received, and revealed that notifications were associated with negative emotional states (Kanjo et al., 2017). As such, the use of passive objective monitoring in research showcases this type of method to be beneficial in capturing both checking and usage behaviours with technology across time, in addition to patterns of psychological well-being.

In light of this, the present study aims to investigate the association between Instagram usage and well-being, employing the use of smartphone-based EMA with passive objective monitoring. Specifically, it seeks to investigate Instagram screen time, number of notifications received from Instagram and number of Instagram app launches on the well-being outcomes of mood, self-esteem and craving. Instagram was chosen as the platform of interest due to its potential influence on well-being, as discussed in Chapters 5 and 6. This study was conducted to trial a bespoke application which was developed to monitor behaviour, named DiaryMood. DiaryMood collects data through the use of active EMA for the well-being variables, whilst also allowing the participant to log their passive objective statistics (i.e., Instagram usage variables) from their smartphone. Given this, the aim of this study was to evaluate the use of the application DiaryMood within research design and data collection. It is hypothesised that: i) higher screen time on Instagram will lead to decreased self-esteem and mood, ii) increased number of Instagram launches will lead to increased craving, and iii) higher number of Instagram notifications will lead to increased craving, lower mood and lower self-esteem.

7.2 Methods

7.2.1 Design

The present study was conducted to trial the practicality of DiaryMood within research, evaluating: (i) recruitment capability, (ii) data collection procedures, (iii) suitability of study procedures, and (iv) the preliminary evaluation of participant responses (Orsmond & Cohn, 2015). Smartphone-based ecological momentary assessment (EMA) was implemented across a period of seven days. The variables investigated were mood, self-esteem and craving to use Instagram. Instagram usage time, the number of times Instagram was launched, and the number of notifications received on Instagram was also observed.

7.2.2 Participants

Participants were recruited on a voluntary basis from Nottingham Trent University, as well as on online SNS platforms using the researcher's social network platforms (i.e., Instagram, Facebook and Twitter). The study was advertised online (via Twitter, Facebook and Instagram and an online student recruitment portal). Eligibility criteria included being (i) an Android smartphone user, (ii) user of the platform Instagram, (iii) at least 18 years of age and (iv) able to understand the instructions implemented within the study and provide informed consent. Participants were put into a draw for a £50 Amazon voucher. If participants were psychology students at the university, they were credited with nine SONA credits (i.e., research credit compensation for psychology students who participate in advertised studies) for their participation.

A total of 13 participants took part in the study. Data were collected across a period of five months (February to July 2021). Participants were aged between 18-35 years (M= 24.23, SD= 5.12 years) and consisted of eight women and five men. Further sample characteristics are presented in Table 7.1.

Table 7.1

Socio-demographics of participant sample

N	13
Gender (female, %)	8 (61.54)
Age (years) (mean, *SD*)	24.23 (5.12)
Nationality (n, %)	
British	9 (69.23)
Indian	2 (15.38)
Other	2 (15.38)
Occupation (n, %)	
Student (undergraduate and postgraduate)	8 (61.54)
Employed (full-time)	5 (38.46)
Marital Status (n, %)	
Single	9 (69.23)
In a relationship	2 (15.38)
Divorced	2 (15.38)

7.2.3 Procedure and measures

7.2.3.1 The DiaryMood app

The DiaryMood app was developed with a set of questions regarding momentary mood, self-esteem and craving to use Instagram. In addition, DiaryMood enabled participants to log Instagram usage, including their usage time, number of notifications received on Instagram

and number of times they launched Instagram during the day. DiaryMood was developed as there has been no mobile application to date (to the researcher's knowledge) that measures nuances of Instagram usage on different well-being outcomes. When developing DiaryMood, objective measures of usage were initially inspired from the results of the systematic review detailed in Chapter 3. Specifically, screen time, launches, and notifications were identified as being predominant features of usage to observe, as these mapped onto general usage time on the platform, number of times the platform was opened, and a proxy measure of checking the app, respectively. Other objective features that were considered to also be included were time spent scrolling or refreshing content on Instagram, and number of pictures shared/uploaded or liked on Instagram. However, due to practical limitations and feasibility to include these features within the app, these were not included in the prototype and final mobile application. Initially, it had also been hoped to include sensors within the app to allow for automatic extraction of objective data, however concerns for privacy and battery consumption were considered and it was decided that sensors would not be included. The final DiaryMood app that was used within the present study therefore included measures of screen time, notifications and launches, in addition to well-being measures of mood, self-esteem and craving.

Upon installing the DiaryMood application, participants were sent calendar notifications three times a day (morning, afternoon and night, approximately 9:00, 15:00 and 21:00, respectively) for seven days to complete the mood, self-esteem and craving measures. Participants were only required to complete Instagram usage statistics once at the end of each day over the seven-day period. DiaryMood also collected the demographical information of participants once they first opened the application. For this, information about age, sex, nationality, occupation, and marital status were collected.

7.2.3.1 Daily questionnaire

Mood

Mood was measured using a visual analogue scale based on the Fordyce Emotions Questionnaire (Fordyce, 1988). The Fordyce Emotions Questionnaire has been shown to have strong convergent validity and good reliability (Fordyce, 1988; Hammersley, 2019). The following instruction and rating scale was used: *Rate your mood (1 = extremely unhappy; 5 = extremely happy)*, with 3 (*neutral*) as the midpoint.

Self-Esteem

Self-esteem was measured using the single item self-esteem scale (Robins et al, 2001). This scale measures global self-esteem and has strong convergent validity with the Rosenberg Self-Esteem Scale (Robins et al., 2001). The following instruction was used: *Rate your self-esteem.* Participants then answered the prompt *'I have high self-esteem'* on a scale ranging from 1 (*not very true of me*) to 5 (*very true of me*), with 3 as the midpoint.

Craving

Craving was measured using a visual analogue scale based on Stieger and Lewetz's (2018) scale. The following instruction and rating scale was used: *How much would you like to be on Instagram right now? (1= not at all; 5 = very much)*, with 3 as the midpoint.

The scales for mood, self-esteem and craving as displayed in DiaryMood are presented in Appendix X.

7.2.3.3 Ethical considerations

This research was conducted in line with the Code of Human Research Ethics (British Psychological Society, 2021), and was granted ethical approval by the university ethics committee. Prior to data collection, full informed consent was obtained from participants. All data were fully anonymised by giving participants unique user IDs for the application, and data were stored on a password-protected database. Participants gave full informed consent to receive calendar notification reminders three times per day.

Due to the nature of data collection via smartphone, participants' privacy was protected throughout the study. Specifically, the logs of each of the observed variables (mood, self-esteem, craving, Instagram usage, notifications and number of launches) were stored in the external directory of the participants' Android device, and no data outside of these logs were collected or stored in any capacity.

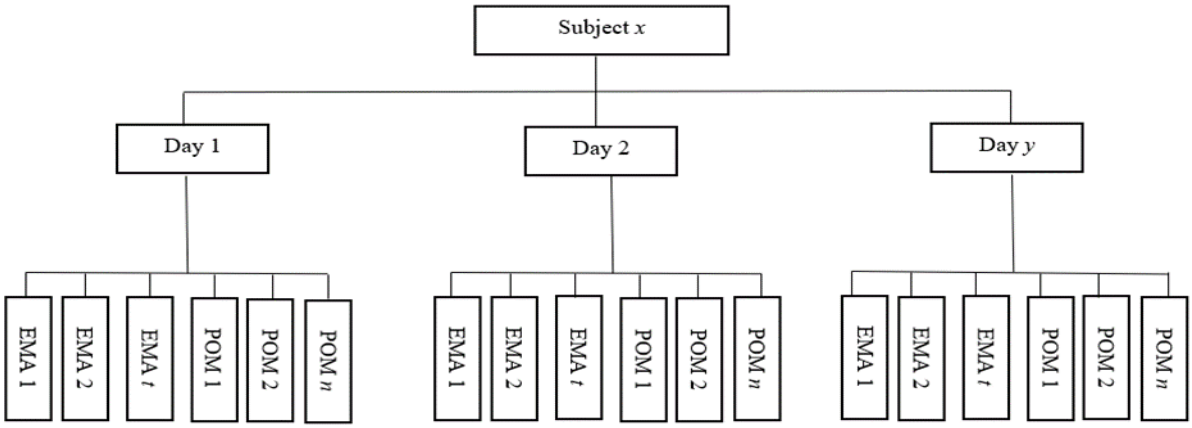
7.3 Analysis

Descriptive statistics were used to assess the means and standard deviations of the measures and Instagram usage across seven days. Multilevel correlation analysis was used to assess the relationships between variables and was employed to account for differences between participants (Makowski et al., 2019). Multilevel models were conducted to examine the associations between well-being and objective Instagram usage variables throughout a week. Assumptions for linearity, homogeneity, normality and multicollinearity were also checked. Statistical analyses were performed using RStudio. The 'psych' package was used for the descriptive and correlational analysis (Revelle, 2021). Multilevel models were calculated using the R package 'lme4' (Bates et al., 2015) by nesting daily observations (level 1) within days (level 2) within participants (level 3). An example of the hierarchical data structure is depicted in Figure 7.1. Missing data were handled using the package 'mice' (van Buuren et al., 2011). Missing data were treated as missing at random (MAR), as there were no apparent

missing data patterns within the dataset. These missing data were estimated using predictive mean matching (Little, 1988), whereby missing items are imputed by the observed outcome from participants with a similar predicted outcome (Morris et al., 2014; Bailey et al., 2020).

Figure 7.1

An example of the hierarchical data structure



Note. Daily observations (ecological momentary assessment [EMA] and passive objective monitoring [POM]) (level 1) are nested within days (level 2) nested within subjects (level 3).

Multilevel analysis was conducted to investigate the research questions for the present study. Instagram usage time, notifications and launches of the app were predictors of mood, self-esteem and craving over seven days. There were three outcome variables for measuring Instagram usage over one week: mood, self-esteem and craving to use Instagram. Both predictor and outcome variables were treated as continuous. The same modelling procedure was followed for all three outcome variables. Firstly, the unconditional model was tested with the outcome variable (either mood, self-esteem or craving). After this, Instagram usage time, launches and notifications were added, followed by the inclusion of days (i.e., days of data

collection period). Random intercept models and random slope models were compared for fit for each of the three variables using Akaike's Information Criteria (AIC) and Bayesian Information Criteria (BIC) (Akaike, 1974; Schwarz, 1978).

7.4 Results

7.4.1 Descriptive statistics

The results indicate that on an average day, participants scored within the mid-range (neutral) for mood and self-esteem. The average for craving was just under the mid-range, suggesting that across the seven-day data collection period, participants had low-mid levels of craving to use Instagram. Intraclass correlations (ICCs) showed that of the total variance in mood, 24.38% was attributable to between-person variation, whereas 75.62% was attributable to within-person variation. Of the total variance in self-esteem, 23.86% was attributable to between-person variation, whilst 76.14% was attributable to within-person variation. For craving, 18.72% of the total variance was attributed to between-person variation, whereas 81.28% was attributable to within-person variation. This indicates that over half of the overall variance was at the within-person level, suggesting that participants differed regarding their usual levels of well-being outcomes more than they differed from each other. Sample statistics and ICCs for the variables included are presented in Table 7.2.

Table 7.2

Means and standard deviations of participant scores

N=13	Mean	*SD*	ICC
Mood	3.62	0.94	0.24
Self-Esteem	3.52	0.79	0.24
Craving	2.43	1.10	0.19
Average Usage Time (minutes)	14.92	33.21	0.07
Average Notifications	3.37	11.44	0.07
Average Launches	5.92	14.26	0.11

7.4.2 Multilevel correlation analysis

Associations between well-being variables in the present sample ranged from weak to strong. Correlations varied between lowest (r= -0.003) for mood and craving, and highest (r=0.70) for mood and self-esteem. For objective Instagram use variables, strong correlations were found ranging from r=0.61 between launches and notifications and r=0.74 between usage time and notifications. A multilevel correlation matrix is presented in Table 7.3.

Table 7.3

Multilevel correlation matrix between well-being and objective Instagram use variables

	Mood	Self-Esteem	Craving	Usage Time	Notification	Launch
Mood	1.00					
Self-Esteem	0.70**	1.00				
Craving	-0.003	-0.13	1.00			
Usage Time	0.09	-0.03	0.11	1.00		
Notification	0.03	-0.02	0.10	0.74**	1.00	
Launch	-0.0008	-0.008	0.06	0.68**	0.61**	1.00

*p <.05 **p<.001

7.4.3 Multilevel model analysis

Model fit

For mood as the outcome variable (Model 1), the multilevel model with random intercepts and random slopes was the best fit (AIC=702.80, BIC= 735.28). For self-esteem (Model 2) and craving (Model 3) as outcome variables, random intercept models were the best fit (self-esteem as outcome variable: AIC= 613.03, BIC = 638.47; craving as outcome variable: AIC = 805.89, BIC=831.15). Model fit statistics are shown in Table 7.4.

Table 7.4

Model fit statistics

	Model fit			
	Model 1		Model 2	Model 3
AIC	702.80		613.03	805.89
BIC	735.28		638.29	831.25
Deviance	684.80		599.03	791.89
X^2 (df)	4.60(2)	p=0.10	2.30(0)	1.23(0)

Multilevel model with random intercepts and slopes

Model 1: Mood as outcome variable

Levene's test, based on the median, was performed. It was indicated that there was significant variance between participants regarding daily levels of mood ($p < 0.05$). The average level of mood on a prototypical day was shown to be approximately 3.61. It was found that mood decreased over the course of the seven-day period by -0.01. For every unit increase of Instagram usage time in a day, participants' mood also increased by 0.17, although this was not significant. For every unit increase in number of notifications in a day, a small decrease in mood (-0.03) occurred. Similarly, as each unit for Instagram application launches increased, participants' mood decreased by -0.10. The effects of both notifications and launches however were not significant.

Moreover, it was found that over the period of seven days, the variance of Instagram use was small between participants (0.01), indicating that Instagram usage time, number of notifications and number of launches were similar for participants across the period of data

collection. The results of Model 1 with mood as the outcome variable are presented in Table 7.5.

Table 7.5

Results of the random intercept and slopes multilevel model analysis with mood as outcome

	B (SE)	95%CI	β (SE)	Standardised 95% CI
Intercept	3.61(0.18)**	[3.26, 3.95]	0.00 (0.14)	[-0.28 – 0.28]
Day	-0.004(0.034)	[-0.05, 0.05]	-0.01(0.07)	[-0.01 – 0.35]
Usage Time	0.005(0.003)	[-0.00,0.01]	0.17(0.09)	[-0.20 – 0.14]
Notifications	-0.002(0.007)	[-0.02.0.01]	-0.03(0.08)	[-0.25 – 0.05]
Launches	-0.006 (0.005)	[-0.02,0.00]	-0.10(0.08)	[-0.15 – 0.14]
Random effects	Variance	*SD*		
Within subject	0.63			
Between subject	0.25			
Between day	0.01			
Subject (Intercept)		0.50		
Residual		0.79		
Random effect correlation				
Day	-0.48			

*p <.05 **p<.001

Multilevel models with random intercepts

Model 2: Self-esteem as outcome variable

Levene's test, based on the median, was performed. It was shown that there was significant variance between participants regarding daily levels of self-esteem (p< 0.05). It was found

that the average self-esteem level on a prototypical day was 3.68. Self-esteem decreased by -0.09 over the seven-day period of data collection. Every unit of increase for Instagram usage time in a day was found to also decrease self-esteem by -0.06. For every unit increase in both notifications and Instagram launches, it was found that self-esteem increased by 0.02. However, there was a non-significant effect between all three variables (usage time, notifications and launches) on self-esteem. Results also found that within subject variance was high (0.48), indicating that participant's self-esteem fluctuated across the course of the seven-day data collection period. The results of Model 2 with self-esteem as the outcome variable are presented in Table 7.6.

Table 7.6

Results of the random intercept multilevel model analysis with self-esteem as outcome

	B (SE)	95%CI	β (SE)	Standardised 95% CI
Intercept	3.68(0.14)**	[3.39, 3.96]	-0.00(0.14)	[-0.27 – 0.27]
Day	-0.035(0.021)	[-0.08, 0.01]	-0.09(0.05)	[-0.19 – 0.02]
Usage Time	-0.001(0.002)	[-0.01,0.00]	-0.06(0.09)	[-0.24 – 0.12]
Notifications	0.001(0.006)	[-0.01,0.01]	0.02(0.09)	[-0.15 – 0.19]
Launches	0.001 (0.004)	[-0.01,0.01]	0.02(0.08)	[-0.14 – 0.17]
Random effects	Variance	*SD*		
Within subject	0.48			
Between subject	0.14			
Subject (Intercept)		0.37		
Residual		0.69		

*p <.05 **p<.001

Model 3: Craving as outcome variable

Levene's test, based on the median, was performed. It was indicated that there was significant variance between participants regarding daily levels of craving ($p < 0.001$). Results demonstrated that the average level of craving on a typical day was 2.25. Craving was shown to increase over the course of the seven-day period by 0.06. For every unit increase of Instagram usage time and number of notifications in a day, craving also increased slightly by 0.10 for usage time and 0.04 for notifications, respectively. However, the effects of both usage time and notifications were not significant. Results also found that for every unit increase in launches in a day, craving decreased by -0.04; however, this effect was not significant. It was also found that within-subject variance was very high (0.99), indicating that participants' craving fluctuated greatly across seven days. The results of Model 3 with craving as the outcome variable are presented in Table 7.7.

Table 7.7

Results of the random intercept multilevel model analysis with craving as outcome

	B (SE)	95%CI	β (SE)	Standardised 95% CI
Intercept	2.25(0.18)**	[1.88, 2.62]	0.00(0.12)	[-0.24 – 0.24]
Day	0.034(0.030)	[-0.03, 0.09]	0.06(0.06)	[-0.05 – 0.17]
Usage Time	0.003(0.003)	[-0.00, 0.01]	0.10(0.09)	[-0.08 – 0.29]
Notifications	0.004(0.008)	[-0.01, 0.01]	0.04(0.09)	[-0.13 – 0.22]
Launches	-0.003 (0.006)	[-0.02,0.01]	-0.04(0.08)	[-0.19 – 0.12]
Random effects	Variance	SD		
Within subject	0.99			
Between subject	0.18			
Subject (Intercept)	0.18	0.43		
Residual	0.99	0.99		

*p <.05 **p<.001

7.5 Discussion

The present study aimed to investigate the association between Instagram usage and well-being, employing the use of smartphone-based EMA with passive objective monitoring. In addition, this study also aimed to evaluate using the application DiaryMood within research design and data collection. It was hypothesised that: i) higher screen time on Instagram will lead to decreased self-esteem and mood, ii) higher Instagram launches will lead to increased craving, and iii) higher number of Instagram notifications will lead to increased craving, lower mood and lower self-esteem. Findings revealed that the effects of Instagram usage time, Instagram notifications and number of Instagram launches on mood, self-esteem and

craving were not significant. However, the small associations and over-time variations within participants found within the present study acknowledge DiaryMood as being a useful method to employ within SNS and well-being research.

Findings revealed a non-significant effect between screen time usage and self-esteem and mood. This adds to previous literature that has shown screen time as not necessarily being detrimental to well-being (Sanders et al., 2019). For example, as discussed in Chapters 5 and 6, Instagram can provide an environment enabling individuals and communities to draw on support and information from others, contributing to the building and maintenance of social capital and relationships (Bekalu et al., 2019; Naslund et al., 2020). Indeed, it has been shown that access to resources promoting social connectivity and information on SNS has been linked to positive outcomes engendering feelings of trust and reciprocity (Nieminen et al., 2013), whilst forms of social capital, such as maintaining and forming social ties, has been linked to positive psychological well-being, such as self-esteem (Nabi et al., 2013). From a Uses and Gratifications (U&G) perspective, this suggests that Instagram users are aware of their motives to use the platform, selecting their media according to their intentions of usage (Katz 1959; Alhabash & Ma, 2017). Therefore, the objective measure of screen time may remain too broad to capture the contextual affordances sought by users. That is, despite being an image-based environment, which can expose users to appearance-based content that may be detrimental to body image and BDD outcomes (see Chapters 5, 8 and 9), Instagram still provides features that can gratify users' everyday needs (e.g., information seeking, connecting with others) that individuals can easily access (Ryding & Kaye, 2018). However, the present study did not include an assessment of specific types of content viewed by users, indicating the need to address how specific content consumption may relate to features of SNS such as screen time, and the subsequent outcomes this can have on well-being and body image in future research.

Contrary to previous literature, which has suggested that absent-minded interactions with SNS leads to an increased pattern of SNS usage and increased craving (or salience) to use SNS (Oulasvirta et al., 2011; Griffiths et al., 2014; Shensa et al., 2018), the present study found that the number of Instagram launches were not significantly associated with levels of craving. Following from the U&G as aforementioned, this may reflect that users obtained the gratifications they sought when going onto Instagram (Tanta, et al., 2014), fulfilling their intentions of usage and satisfying their needs. Arguably, the attainment of gratifications online has also been shown to lead to increased usage (Tanta et al., 2014). For example, in the context of social gratifications, SNS can provide a sense of belonging and acceptance, stimulating the interpersonal interactions and feelings of belonging within an offline context (López et al., 2019). As a result, this may lead to users relying on the connections and communications online to fulfil their need to belong, at the expense of their offline relations. That is, according to the social compensation hypothesis in this regard, users may turn to SNS where socialising is accessible for them, rather than socialising with those around them (Zhou et al., 2020). Therefore, in a short-term capacity, users may profit from the benefits of social gratification; however, in the long term, this may lead to detrimental effects if users begin to rely on SNS for socialising (Bodroža & Jovanović, 2016). For example, it has been posited that an increased pattern of repetitive visits on SNS can lead to lower self-esteem and increased body image dissatisfaction due to the lack of social support online, in addition to increased exposure to appearance-based images and the increased opportunity for appearance-based comparisons (Kim & Chock, 2015; Baturay & Toker, 2017; Elhai et al., 2017).

Within the present study therefore, launches may not be enough to deduce well-being patterns. It has been indicated however, that time per interaction (TPI) rates (i.e., the duration of time spent on platform per application launch) can be beneficial in inferring interaction

types and habitual usage patterns. In particular, it has been shown that lower TPIs reflect app usage that is short in duration and more frequently launched, whilst higher TPIs reflect longer duration usage, but with less frequent app launches (Tossell et al., 2015). Shorter and more fragmented interactions may be reflective of problematic and habitual SNS usage patterns (Tossell et al., 2015), and it has been indicated that habitual behaviour can be triggered by internal cues such as the urge to use SNS (van Deursen et al., 2015). As such, the inclusion of TPI within future research would be useful in further understanding the association between launches and craving to use Instagram.

Moreover, contrary to previous research that has indicated notifications as having a detrimental influence on well-being outcomes as a result of social overload or FOMO (Kanjo et al., 2017; Chai et al., 2019; Alutaybi et al., 2020), findings also revealed a non-significant effect between Instagram notifications on craving, self-esteem and mood. However, these findings may be congruent with research that has demonstrated that complete lack of notifications is associated with increased anxiety as a result of FOMO (Fitz et al., 2019). That is, not receiving any notifications at all may exacerbate a fear of missing interactions from others on SNS rather than mitigate anxieties of missing something important (De-Sola et al., 2017). Specifically, this may lead to cognitive overload around fear of missing large volumes of events, subsequently leading to a fear of missing information and increase in SNS use in an attempt to lessen feelings of FOMO (Alutaybi et al., 2019). From this perspective, notifications can play a role in managing FOMO, which may have been reflected in the findings of the present study.

The present study also evaluated the viability of using DiaryMood within SNS and well-being research. As such, several reflections are highlighted. Firstly, as DiaryMood was developed for the Android system, this eliminated a potentially sizeable sample of iOS users (Prasad et al., 2018), as they were not eligible to participate. It has been indicated that usage

behaviours may differ between iPhone and Android devices (Shaw et al., 2016). Thus, developments of the application in future research would benefit in updating DiaryMood to be suitable for other devices supporting iOS, and further research exploring Instagram interactions between different devices would be beneficial to establish any differences in behavioural patterns.

Secondly, data collection occurred across a period of seven days, and it has been suggested that longer term data collection regarding objective passive measures would be more insightful to observe changes in SNS use in light of contextual changes (e.g., changes in users' schedules) (Shin & Dey, 2013). However, it has also been indicated that five days is sufficient to reflect SNS usage, whilst checking behaviours (e.g., launches) can be reliably inferred within 48 hours (Wilcockson et al., 2018). Thus, a longer time period of data collection may not be necessary. However, it would be beneficial to trial DiaryMood for a longer time period to establish its usability in longitudinal studies, and to explore whether there are any contextual changes in both Instagram interaction and well-being outcomes. In addition, whilst EMA can be beneficial in providing increased ecological validity, it has also been demonstrated that compliance rates can erode substantially across two weeks of data collection (Schwartz et al., 2002). As such, the seven-day period of data collection seemed suitable for the present study, and was able to deduce Instagram patterns and well-being levels throughout this period. Indeed, despite the non-significant results within the present study, results showed evidence of usage patterns and well-being outcomes as fluctuating in parallel with one another across the period of data collection. In this sense, DiaryMood was able to provide insight into the nuances of user behaviour and its potential influence on well-being.

7.5.1 Implications

Predicting user behaviour based on user SNS interaction and responses to their interactions can contribute to identifying behavioural patterns that may signify both problematic SNS patterns and psychological health patterns. This is particularly beneficial in identifying and targeting specific features of SNS that may amplify well-being either positively or negatively, and can contribute to interventions for SNS interaction regulation and contextual awareness in well-being.

In addition, the investigation of specific functionalities of SNS use (e.g., application launches and notifications) within research can help contribute towards untangling the conceptualisation of problematic, habitual SNS usage. That is, research has often correlated high screen time with negative outcomes (e.g., Jasso-Medrano & López-Rosales, 2018), or it is presumed that individuals who spend a long time on SNS have a problem with their usage (Andrews et al., 2015). However, heavy use of SNS does not necessarily equate to problematic SNS use (see Chapter 3 for discussion). Employing objective monitoring can contribute towards identifying specific types of SNS use in the context of the individuals and contextual changes to further understand the nuances behind SNS use and the distinctions between heavy SNS use and problematic SNS usage.

7.5.2 Limitations and future directions

Whilst the present study assessed Instagram usage and well-being across a period of seven days, participants commenced the study on different days throughout the period of data collection. This was done in the present study for the convenience of the participants, allowing them the flexibility to take part in the data collection when it was most suitable for them, and to increase compliance rates during the study. As a result, however, potential differences between weekday and weekend Instagram usage and well-being were not accounted for, which may have provided further insight into user patterns. Future research

should therefore observe behaviour across both weekdays and weekends to examine whether there are any differences between patterns of user interaction on Instagram, and to explore whether/ how these may influence well-being.

7.6 Conclusion

The findings of the present study found non-significant associations between Instagram usage time, Instagram notifications and Instagram launches on mood, self-esteem or craving, suggesting well-being outcomes are not influenced by Instagram interaction. However, the use of passive monitoring in conjunction with EMA was found to be beneficial in capturing both checking and usage behaviours, in addition to well-being fluctuations across a period of seven days. DiaryMood was shown to be an advantageous tool in investigating Instagram and well-being associations beyond self-report, and can provide an avenue into providing nuanced insight and understanding into SNS behavioural patterns and the influences of SNS technology on users.

CHAPTER 8

Instagram engagement in BDD: An exploration of the experiences using Instagram with Body Dysmorphic Disorder

The empirical study presented within this chapter explores the experiences of using Instagram whilst living with BDD. The preceding chapters contributed to understanding SNS within a non-clinical population, identifying features and motivations of Instagram use that may contribute towards body image dissatisfaction. The study presented in this chapter, however, was important to understand how individuals experiencing BDD also experience using SNS, to gain insight into how SNS may influence individuals with a body-image based disorder.

8.1 Introduction

Much research has investigated the consequences of SNS in regard to body image, highlighting a relationship between high SNS usage and increased levels of body image dissatisfaction (e.g., Holland & Tiggemann 2016; Ryding & Kuss, 2020). However, the literature to date has tended to focus on weight or shape concerns or on eating disorders such as anorexia and bulimia (e.g., Smith, Hames & Joiner, 2013; Aparicio-Martinez et al., 2019), and there remains a paucity of research surrounding the body-image based disorder Body Dysmorphic Disorder (BDD) and SNS use. Considering the parallel symptomatology between body image disturbance (i.e., the distortion of perception, behaviour or cognition related to weight or shape (Posavac et al., 2002; Pimenta et al., 2009) and BDD, it is pertinent to explore the ways in which SNS usage and engagement may contribute towards the maintenance and potential development of the disorder.

BDD is a body image-based disorder currently classified within the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM-5, American Psychiatric Association, 2013) as an

obsessive-compulsive disorder (OCD). Both BDD and OCD involve obsessions (i.e., repetitive and intrusive thoughts and urges that cause distress), in addition to compulsions or rituals that are engaged in to reduce distress from obsessions (American Psychiatric Association, 2013). However, in OCD, the content of the obsession and compulsions are often wide ranging, whereas in BDD, they are characterised by a preoccupation with a perceived or mild defect in physical appearance (Weingarden et al., 2016). Characteristics of BDD include threat assessment behaviours which include repetitive, time-consuming actions such as mirror checking and excessive grooming, which are targeted towards checking, hiding, fixing, or obtaining reassurance about the perceived appearance flaws (Kelly et al., 2013).

Moreover, individuals with BDD often anticipate criticism and rejection based on negative experiences of how they look, which can lead to increased vigilance for negative reactions in others, characterised by intense self-consciousness and an experience of themselves as if being judged by others (Baldock & Veale, 2019). In this regard, BDD shares characteristics with social anxiety (Kelly et al., 2010; Fang & Hofmann, 2010), although in BDD, the anxiety experience is driven by appearance-related concerns, as opposed to facets of social performance. However, recent evidence has shown that people living with BDD are up to four times more likely to experience suicidal ideation and over two times more likely to engage in suicide attempts in comparison to individuals without the disorder, which is as high as those found in anxiety disorders, post-traumatic stress disorder (PTSD) and major depression (Angelakis et al., 2016). Despite the impact that living with BDD can have on individuals, there is little known about the experience of living with this disorder, highlighting the need to increase knowledge and understanding about BDD. Not only can research on BDD experiences help to further the understanding of health professionals in the

field of BDD, but knowledge of the disorder can also enable individuals to communicate their experiences more openly and seek the help they need (Craythorne, Shaw & Larkin, 2020).

There has been a large body of literature on the role SNS may play on body image (e.g., Cohen & Blaszczynski, 2015; Holland & Tiggemann, 2016), highlighting associations between SNS use and low body image satisfaction, low self-esteem and distorted appearance cognitions (Ridolfi et al., 2011; Hanna et al., 2017). In particular, Instagram is one SNS platform that has been posited to have more detrimental repercussions on body image than any other SNS platforms that contain more varied content (e.g., Facebook) (Fardouly & Vartanian, 2016; Cohen et al., 2017; Fardouly et al., 2017). Instagram is a predominantly photo-based, visual environment, which can encourage content shared by others to promote idealised photos of themselves that are focussed on appearance, (Sheldon & Bryant, 2016; Senín-Calderón et al., 2020). Not only this, but the interactive features available on Instagram (e.g., likes and comments) can act as an avenue for feedback and evaluation on the attractiveness of oneself and others, which may reinforce attitudes and behaviours associated with appearance and body image (Tiggemann et al., 2018; Senín-Calderón et al., 2020). As such, in the context of BDD, Instagram may be particularly problematic due to the accessibility to appearance and body image-based photos online.

Viewing photos online can be particularly problematic to individuals with BDD. Research employing eye-tracking has demonstrated that individuals with BDD selectively attend to specific perceived flaws or areas of appearance concern when viewing images of their own face, and attractive features of another's face (Greenberg et al., 2014; Toh, Castle & Rossell, 2015). Moreover, neurocognitive research using functional magnetic resonance imaging (fMRI) has found individuals with BDD over-utilise the detail-oriented left hemisphere of the brain in comparison to healthy controls when exposed to photographs of neutral images (oval shapes), familiar faces (famous actors) and their own faces (Feusner et al., 2010), providing

evidence to show bias towards detailed evaluation, rather than holistic evaluation of visual stimuli (Feusner et al., 2010). This increased attention to detail can lead individuals with BDD to overemphasise the importance of their perceived flaw, ultimately worsening and maintaining appearance-related distress (Greenberg et al., 2014). In the context of the photo-based platform Instagram, individuals with BDD may be more likely to selectively attend to and focus on their perceived flaws if taking a photograph to post online, and may overestimate the importance of the perceived flaws, interpreting them as reflective of lack of self-worth and of personal defectiveness (Veale et al., 1996; Greenberg et al., 2014). Whilst visual and neurocognitive research provides insight into the visual attention of BDD, there has been no research to explore the experiences of attending to photographs of the self and others, particularly on an SNS platform. That is, individuals with BDD often react to their perceived flaws and related appearance interpretations with negative thoughts and emotions (Veale, 2004; Windheim et al., 2011). It is therefore important to understand the ways in which BDD individuals experience these feelings when viewing appearance-related images in an online environment, to try and identify how negative affect can be managed when using SNS platforms.

In addition, the most commonly reported and perhaps most problematic BDD behaviour is that of appearance comparisons to others (Anson et al., 2015). There has been a growing body of literature showing the association between comparisons on SNS and body image dissatisfaction (Hendrickse et al., 2017; Choukas-Bradley et al., 2018; Verduyn et al., 2020), and these associations are often explained in the context of Social Comparison Theory, whereby individuals evaluate and compare themselves to others whom they perceive as holding superior qualities to themselves (Festinger, 1954; see Chapters 2 and 5 for discussion). In BDD, appearance comparisons tend to focus on the perceived flaw with the parallel feature in others (Anson et al., 2015). This can maintain BDD symptoms through

reinforcing the self-focus of a distorted internal image and increasing negative appraisal (Veale, 2004; Anson et al., 2015). Individuals tend to undervalue their own attractiveness and over-value the attractiveness of those they believe possess ideal appearance characteristics. Further, it has been demonstrated that when viewing images of others, thoughts regarding the BDD individual's own appearance are triggered (Moody et al., 2017), which can further increase selective attention to their perceived flaws. This process during comparison may be explained by self-discrepancy theory (SDT; Higgins, 1987), which posits that there are three domains of self-beliefs: (i) the actual self which represents an individual's actual attributes and characteristics, (ii) the ideal self which refers to the attributes that the individual aspires to possess, and (iii) the ought self which reflects the attributes the individual feels they have an obligation to possess (Vartanian, 2012; Veale et al., 2016). The ideal and ought selves are referred to as 'self-guides', and any discrepancy between the actual self and the self-guides can determine an individual's vulnerability to negative emotional states (Higgins, 1987). Thus, possessing an appearance self-discrepancy may play a role in the engagement of comparisons to appearance-based online media.

Moreover, societal standards of attractiveness can be made salient online through interactive features (e.g., likes and comments), which can add meaning and amplify the presence of appearance-based photos (Kim, 2020). In turn, an individual who perceives this standard to be self-relevant may then use this image as a basis for self-comparison, self-judgement and self-regulatory processes (Bessenoff, 2006). Thus, individuals possessing a body image self-discrepancy (e.g., between the ideal self and actual self) may associate the failure to reach a body ideal with their self-concept (Bessenoff, 2006; Vartanian, 2012). Indeed, research looking into comparisons in BDD has found that BDD individuals are significantly less satisfied with their appearance and rated themselves as less attractive than their target of comparisons (Anson et al., 2015). However, studies that have explored appearance

comparisons have investigated comparisons with the use of self-report measures (Anson et al., 2015), which cannot provide insight into the ways individuals with BDD experience comparisons. Exploratory research can provide important insight into the ways individuals experience living with BDD, highlighting the need for further research to shed light onto the role of online comparisons in BDD.

From a cognitive-behavioural perspective of BDD, the value and importance placed on appearance may be a result of conditioning and social learning (Veale, 2004; Baldock & Veale, 2019). When one observes others' comments on appearance generally, to either oneself or others (either positive, negative or neutral comments), this may lead individuals to associate their appearance with self-worth (Baldock & Veale, 2019). Body image research has demonstrated likes and comments to be a marker of peer approval and validation of physical appearance (Dumas et al., 2017), which can ultimately add meaning and valence to appearance-based media (Rodgers, 2016; Kim, 2020). Therefore, it can be posited that individuals with BDD who post images of themselves may look at feedback through these features as a way to gain reassurance on their appearance. However, this may exacerbate BDD symptoms if feedback is negative or there is perceived lack of approval (Ahmadpanah et al., 2019).

Appearance-based rejection sensitivity is an important mechanism in BDD, whereby individuals expect social rejection based on physical appearance. This contributes to feelings of anxiety and fear that others will negatively evaluate their appearance (Park, 2007; Kelly et al., 2010). Thus, adverse social experiences such as appearance teasing or perceived negative evaluation of appearance (e.g., perceived lack of likes) become attributed to appearance (Webb & Zimmer-Gembeck, 2015). Moreover, these responses have been shown to be heightened in situations where one's appearance is visible to others (Park & Harwin, 2010). Posting of content to non-specific users through 'broadcasting' on Instagram (i.e., posting on

SNS but the content is not directed to specific individuals; Sheldon & Byant, 2016; Yang, 2016) suggests individuals with BDD may express greater negative affect by interpreting appearance feedback through likes and comments more negatively (Park & Harwin, 2010). As a result, this can escalate symptoms of BDD as individuals increasingly focus on their perceived flaws and become more compulsive about their appearance concerns (Webb et al., 2015). To the researchers' knowledge however, there has been no research to date that has explored the role of likes and comments of photos on Instagram in the experience of BDD. These features may play a role in the maintenance of BDD symptoms and the exacerbation of negative affect in individuals, and highlight a need to understand how individuals with BDD experience features of Instagram whilst using the platform.

BDD is a greatly personal experience for those living with the disorder, yet research that explores the individual experiences of living with BDD is scarce (Veale et al., 2016). Research that has employed qualitative methods has used thematic analysis to explore how individuals with BDD view themselves, identifying themes around threat perception, a wish for symmetry and regularity, the duty to look good, and a focus on specific "defective" features (Silver et al., 2010). However, whilst this approach to data collection can identify experiences, approaches such as interpretative phenomenological analysis (IPA) take a focus on the idiographic, unique characteristics of how individuals make meaning of their experiences, which can allow closer insight into participant experience (Spiers & Riley, 2019). There is a small body of literature that has explored BDD experiences in the context of mirror gazing, providing insight into the confusing, imprisoning, and distressing relationship BDD individuals have with mirrors (Silver & Farrants, 2015), whilst more recent research employed the use of IPA, in conjunction with drawing analysis to facilitate discussion, to explore the ways in which individuals experience coping with BDD (Craythorne et al., 2020). To date however, there is no research to the authors' knowledge that explores the experiences

of using SNS whilst living with BDD. Given the growth of SNS platforms and the accessibility to visual, appearance-based content online, research into the ways individuals with BDD experience SNS is needed to increase understanding of the disorder and to bring awareness of the potential role SNS may have on BDD symptoms, for both people living with the disorder and for health professionals within the field. Therefore, the present study aimed to explore how individuals experience using SNS whilst living with BDD, with a focus on the platform Instagram.

8.2 Method

8.2.1 Design

Interpretative Phenomenological Analysis (IPA) was adopted to explore how individuals experience BDD. The foundation of IPA is based on three primary underpinnings. The first theoretical underpinning is phenomenology, based on Husserl's philosophy (1931). From this perspective, our sense of knowledge is a result of our spatial and relational place in the world (Larkin et al., 2019). Thus, in IPA, phenomenology aims to suspend preconceptions and remain open to individual accounts of lived experiences, in particular addressing and exploring the meanings that participants bring to their experiences (Rajasinghe, 2019). For the present study, this was beneficial to explore the lived experiences of BDD individuals and the meanings they associate with using SNS with BDD. Secondly, IPA consists of a double hermeneutic process, whereby the researcher attempts to make sense of the individual trying to make sense of their own experience. Doing so involves the navigation of different layers of interpretation, and thus the double hermeneutic process can arise from dual interpretative engagement: the hermeneutics of empathy and hermeneutics of suspicion (Ricoeur, 1970; Eatough & Smith, 2017). In IPA, the former helps the researcher assume an empathetic stance and take an insider's view of the participant's experiences, whilst the latter aims to be critical and probe for meanings beyond face value to generate deeper understanding of

participant's experiences (Eatough & Smith, 2017; Rajasinghe, 2019). This was important for the present study to remain close to the participants sense-making in their experiences of using SNS in BDD, in addition to encouraging the researcher to put aside face-value meanings of the participants' narrative to develop a multi-layered narrative of possible meanings participants bring to their experiences (Eatough & Smith, 2017). Lastly, idiographic interest of IPA encompasses the process of engaging with the in-depth experience of each individual case before producing more general claims (Smith & Osborn, 2015; Dimler et al., 2017). In the present study, this was important to ensure themes remained reflective of participants narratives, to reveal the intimate and nuanced accounts of BDD and SNS experiences from the perspective of those experiencing it (Noon, 2018).

In the present study, the use of IPA was beneficial as it illuminated Instagram experiences of individuals with BDD symptoms. Living with BDD is an experience unique to each individual, and IPA allowed for the exploration of how each participant made sense of their own experiences. Semi-structured interviews were conducted to gain understanding of individuals' experiences of using SNS. The interviews conducted encouraged dialogue between the participants and researcher, allowing not only the opportunity for the participants to describe and reflect upon their experiences, but also enabled the researcher to interpret the participants' experiences through the discourse that emerged during the conversation and subsequent analysis (detailed in the Analysis section).

8.2.2 Participants

Due to IPA's ideographic focus, a small, purposeful sample of eight participants were recruited, to allow the researcher to commit a thorough, in-depth analysis of each individual case (Noon, 2018). Participants were recruited from advertisements placed on one BDD charity website and its associated social media platforms (Twitter and Facebook), in addition to one OCD charity website. Participants were included if they: i) identified as living with

BDD, ii) were users of SNS, including the platform Instagram, and iii) were 18 years old or above. Individuals were classed as identifying living with BDD if they had a clinical diagnosis with BDD, or experienced BDD symptoms without a clinical diagnosis, as it has been shown that subthreshold BDD (where symptoms of the disorder do not meet the full diagnostic criteria) involves the presence of core BDD symptoms and impairment and can predict clinical manifestations of the disorder (Wolitzky-Taylor et al., 2014). Six participants were female and two participants were male, with an age range between 19-32 years (M = 25.12, SD = 4.85). Five participants were clinically diagnosed with BDD, and three participants were experiencing BDD symptoms at the time this study was conducted but did not have a clinical diagnosis of BDD. Participant characteristics are presented in Table 8.1.

Table 8.1

BDD participant characteristics

Demographics	**N**	**(%)**
Gender		
Female	6	75
Male	2	25
Age (years)		
Mean *(SD)*	25.12(4.85)	
Age range	19-32	
Ethnic background		
White	6	75
Black or African American	1	12.5
Other mixed background	1	12.5
Occupation		
Employed	4	50
Student (undergraduate)	1	12.5
Student (graduate)	1	12.5
Unemployed	1	12.5
Not specified	1	12.5

8.2.3 Procedure and materials

Demographics

Information about age, gender, ethnicity and occupation were collected.

Interviews

Semi-structured interviews were conducted to gain understanding of individuals' experiences of using SNS, whilst living with and experiencing BDD symptoms. Questions were developed to explore facets of BDD symptoms experienced, SNS use and using SNS with BDD (see Appendix XI). In addition, all main questions had associated follow-up questions to prompt a more detailed response. For example, the question "Can you tell me about a time you've felt that using Instagram has affected your BDD symptoms, either positively or negatively?" contained the follow-up question "Can you tell me more about how that made you feel at the time?". Interviews were conducted via telephone (*n*=3) or Skype (*n*=5), between July 2019 – June 2020. Each interview lasted an average of 38 minutes (ranging between 19 -58 minutes).

8.2.4 Ethical considerations

This research was conducted in line with the Code of Human Research Ethics (British Psychological Society, 2021), and was granted ethical approval by the university ethics committee. Prior to conducting each interview, full informed consent was obtained from participants. All audio-recordings and transcripts were fully anonymised and stored on a password-protected database. Any identifiable information to participants was also anonymised in the results section.

Due to the personal experiences and nature of BDD, it was possible that the interviews would cause distress in participants when reflecting upon their experiences (Noon, 2018).

Accordingly, it was made clear to the participants before commencing the interview that they may pause or stop the interview at any time if they started to feel uncomfortable or distressed sharing their experiences. The researcher ensured to monitor the effect of the discussion on participants throughout the interview by pausing and checking in on the participants at any time they felt the participant was becoming upset during the conversation. Moreover, in addition to a written debrief, an oral debriefing process was also adopted to give participants the opportunity to discuss any concerns, ask any questions and reflect upon the interview.

8.3 Analysis

Interviews were analysed following the stages of IPA (Smith, 2004; Pietkiewicz & Smith, 2014; Alase, 2017; Etough & Smith, 2017). The first stage consisted of the reading and re-reading of each transcript, making initial comments of features of potential significance, in addition to recollections of the interview. Second, exploratory comments were made for each individual transcript, focussing on three different levels of analysis: i) descriptive, which focussed on face-value content and description of content of interest, ii) linguistic, which reflected on the language and linguistic features used by the participant, and iii) conceptual, which focussed on questioning the data and moving towards interpreting the meanings behind what was being said. Following this, notes were transformed into emergent themes by way of developing concise statements that captured a more psychological conceptualisation of concise phrases within the transcripts. For each individual transcript, connections were then searched across emergent themes to produce a number of subordinate and associated emergent themes. In this stage, some themes were dropped as they either had a weak evidence base within the data or did not fit in with the emerging structure (Pietkiewicz & Smith, 2014). Lastly, conceptually similar connections across all participants were collated (see Appendix XII for example of theme development). Through this process, individual emergent themes and subordinate themes were relabelled before subordinate themes were

clustered together to form superordinate themes. This resulted in the three superordinate themes and nine subordinate themes. The following section presents the results and discussion of the dataset together, allowing for the multi-levelled interpretation of participant experiences, as recommended for IPA analysis (Pietkiewicz & Smith, 2014; Etough & Smith, 2017).

8.4 Results and preliminary discussion

A total of three superordinate themes were developed during analysis: i) *agency online*, ii) *comprehending appearance comparisons as an individual with BDD* and iii) *the value of others' perceptions online*. Each subordinate theme contained a number of related themes, presented in Table 8.2.

Table 8.2

BDD participant superordinate themes and related subordinate themes

Superordinate themes	Subordinate themes
Agency online	Loss of control when viewing images of others
	Regaining control
Comprehending appearance comparisons as an individual with BDD	"It's harder amongst similar people": Wanting the 'normality' of others online
	"Why am I like this?": The self as different to others online
	"Everything about me is so much worthless": Battling with a mind-set of comparisons on Instagram
	Protecting the self
The value of others' perceptions online	The anxiety of judgement
	Validation from others
	Finding a sense of belonging and community online

8.4.1 Agency online

A sense of agency is generally conceptualised as feeling in control of one's actions and their consequences (Moore, 2016). However, within interviews, it emerged that some participants experienced a loss of agency in their use whilst using Instagram. Subsequently, feelings of low self-worth were reported due to the inability to disengage from appearance-based images. Yet, as a result of this, participants utilised their negative experiences as a way to regain their agency online. These experiences are further explored in the subordinate themes *Loss of control viewing images of the self and others* and *Regaining control.*

8.4.1.1 Loss of control when viewing images of the self and others

During interviews, participants described experiencing a loss of control in the form of preoccupation when viewing appearance-based images of either themselves or others, or through feeling an inherent need to respond to others online. For P3, she describes being suggested to look at specific photos on Instagram as difficult, as searching for a certain profile that she does not follow on Instagram led her to feel 'stuck' on the platform, giving the impression that she was unable to move away from photos that she perceived as attractive:

"My sister will WhatsApp me saying you know for example she hasn't but for example like, oh did you see like (name's) wedding, I'd be like oh no, she's be like oh look look at her dress is so nice look on her Instagram, and I'll go on there and then I'll have to actually search when I go on and then I'll be stuck on that page looking at how pretty her and her friends are and be like, you know and (...) you get on someone else's page that they're linked with and it's sort of down the rabbit hole of attractive people erm, whereas if I'm just using my newsfeed and have all that sort of stuff that I'm following, it's just a bit more contained".

Lines 417-422; P3, Female, Age 31

P3 emphasises this loss of self-control in movement as going ‘down the rabbit hole’ when attempting to comprehend her online state. This highlights a sense of difficulty, whilst going ‘down the rabbit hole’ suggests that she loses herself in appearance-based content and in her ability to disengage from attractive images of people. This depicts a lack of self-regulation online, whereby P3 is unable to resist the action of viewing attractive stimuli whilst on Instagram (Osatuyi & Turel, 2018). Moreover, P3 compares her experience of searching content with that of content displayed on her newsfeed, which she describes as being more “contained”, implying that there is a lesser chance of her losing control of her appearance-based browsing. By highlighting these differences between her engagement, this reflects an element of self-awareness in her online situation, whereby she acknowledges that actively searching appearance-based content presents a risk in her Instagram usage.

For P4 however, a lack of control was described in the context of the inability to regulate photos of influencers that appeared on her newsfeed:

“I think even if I don't follow influencers or anything, they come up like whether you follow them or not, you're going to see pictures of amazing, beautiful women who have completely unachievable bodies and (.) if I don't look at them my friends will share them, and as well, it's not just that for me, I feel like I'm, you know sometimes with the Instagram thing, in terms of Instagram being bad for your own sense of self-esteem” ***Lines 90-95; P4, Female, Age 27***

When recounting the images of influencers, P4 described them as “amazing” and “beautiful” conveying an element of marvel towards the women portrayed in the photos. Not only this, but P4’s perception of influencers indicates that she sees them as out of her league appearance-wise, when she states they have “completely unachievable bodies”. This may be suggestive of an appearance self-discrepancy, whereby P4 is over-valuing the attractiveness of the images viewed of women, possessing a perceived ideal body image (Vartanian, 2012;

Teena et al., 2016). Furthermore, P4 states that she would attempt to avoid images of influencers shared by her friends as a way to protect her self-esteem, implying that the inability to control the exposure to influencers is problematic to her self-worth (Cohen & Blaszczynski, 2015). A predominant feature of BDD is the value placed on appearance, and the observations of others on SNS may increase distress of one's own appearance and feelings of low self-worth (Greenberg et al., 2014; Veale & Gilbert, 2014). Thus, within P4's narrative, her sense of self-esteem seems to be reflective of the value placed on the appearance of herself and of others online.

In P2's account, a lack of control was experienced in the context of personal appearance in videos:

> *"You have a lot more control over one snapshot of yourself from a physical perspective whereas a video you've got frame upon frame upon frame that could possibly not look how you want (..) It might be obvious but in my head a video presents more of a risk [of being preoccupied with appearance] (…) I would scrutinise it more than I would a photo, so potentially would have to do it more than once, if I was really unsure about it, or it may be that I film it and then just don't post it if I can't get kind of what I'm looking for on the screen"* ***Lines 306-314;P2, Male, Age 32***

In his narrative, control in appearance seems to be an important element before posting online, remaining consistent with the value placed on appearance in BDD individuals (Baldock &Veale, 2019). P2 refers to not being able to look "how you want" in videos as being "obvious" to other people, but not for himself, implying that his perception to videos is different to others. This is further reinforced by his use of the words "in my head", whereby he comprehends this difference in perception as a result of his introspection towards

appearance. The importance of appearance is further highlighted in the latter part of P2'S account, where he shows a need to scrutinise his videos to get what he's looking for. This may reflect a compulsive appearance-checking behaviour (Webb & Zimmer-Gembeck, 2015), whereby he would "have to do it more than once" to ensure it was up to a standard and good enough to post. Indeed, it has been shown that individuals with BDD examine photos of themselves to observe exactly how their perceived flaws looks (Veale & Gilbert, 2014). Videos present a visual medium which individuals can refer to their appearance, and this indicates that the examination of photos in BDD is also be a behaviour transferred onto a video medium as a response to monitoring appearance.

For P7, his experience of losing control of SNS was described in the context of the immediacy to attend to others on SNS, whereby he drew upon another visual-based SNS Snapchat, to comprehend his experience with image-based platforms:

"My room was kind of somewhere where I was free from the outside world and there were, I (...) kind of had control of what entered and what, you know, what came in, but with Snapchat it kind of (...) felt like people were knocking at my door when I was getting Snapchats, you know these were the things I had to attend to, right now" ***Lines 218-222; P7, Male, Age 19***

Within his account, P7 describes his room as a space for freedom from the outside world. For P7, his room allowed him control of who entered, giving the impression that his room was a doorway between the outside world and his safe space. Indeed, individuals with BDD are often concerned about how other people perceive their appearance and will frequently avoid social situations due to the embarrassment of their appearance (Ayub, Kimong & Ee, 2018). Whilst P7 is not explicit in what he is freed from, the "freedom" P7 seeks may be implied as being the social situations from the "outside world" (Veale & Gilbert, 2014). Moreover, P7 goes on to describe SNS Snapchat as "knocking" at his door. Personifying this platform

creates the impression of P7 attempting to make sense of this experience by anthropomorphising SNS. In this context, it seems as though P7 feels a sense of invasion in the sense that he feels the need to "attend" the Snapchats he receives. This may reflect an element of social reciprocity, whereby P7 feels obliged to check his Snapshats, potentially so as to leave a good impression to the sender or because he feels persuaded to respond in a timely manner (Alutaybi et al., 2020).

8.4.1.2 Regaining control

As a result of negative feelings experienced in losing control online, three participants expressed taking conscious action to control their SNS engagement and to gain a sense of control. In doing so, participants drew upon employing different strategies in the attempt to regain control of their usage. In her account, P3 described an almost cyclical pattern in trying to regain control on her Instagram use:

"I definitely definitely made a conscious choice with who I follow, cause like and over the years I've sort of down I've deleted it and re-downloaded it but I've never like deleted my Facebook account or the app of anything like that but Instagram I've sometimes found has really got to me, especially over summer when people are just constantly posting like holiday photos and stuff like that I find it really difficult" ***Lines 363-368; P3, Female, Age 31***

It has been demonstrated that Instagram can have the most detrimental repercussions in comparison to other SNS sites due to its visual content (Fardouly et al., 2017), which is made prominent in P3's account in her comparison between Facebook and Instagram. Within her account, her past experiences in trying to regain control over her usage seem to be cyclical in the sense that she would "delete it and re-download it", creating the impression that abstinence from the platform when trying to regain control was unsuccessful for her. It is implied within her narrative that her sense of self-awareness and difficulty in viewing certain

content is what led her to curate the people she follows as a way to mitigate negative feelings she felt. This may be reflective of 'digital pruning', the process of sorting through and un-following content that may trigger an undesirable affect or negative mind-set (Hockin-Boyers, Pope & Jamie, 2020), suggesting that for P3, her consciousness of usage was a result of repeated practice and self-reflection.

In a similar vein to P3, curating Instagram was perceived as an act of self-care by P4:

"I've kinda curated my newsfeed to be quite positive, so I just look at pictures of dogs and I follow lots of body positivity stuff, mental health stuff, erm you know quite, quite self-love, nurture type things, so I guess part of what I like Instagram for is that kind of daily dose of um self-care maybe?" ***Lines 60-63; P4, Female, Age 27***

In P4's passage, she frames Instagram in a positive light, conveying a sense of pride in her ability to navigate and direct her usage in a way that is beneficial towards her well-being. In taking back her control of Instagram, she takes conscious responsibility to follow and view content surrounding dogs, body positivity and mental health, which she perceives as "self-love" and "nurture". Moreover, she describes this as a "daily dose of self-care", wherein "daily dose" implies an almost medicinal aspect to self-care which provides beneficial outcomes to well-being when engaged with Instagram on a daily basis.

Other participants, however, did not express having such a directed approach in controlling their Instagram usage. For example, P5 took an approach whereby she tried to restrain her usage of Instagram:

"I try and limit things like that [influencers] as much as I can just because obviously I'm constantly scrolling through, seeing like certain body types or like the complexion of someone's skin as well so like, I know in my head I'm like, that isn't real so there's no point

like fixating on stuff like that because it's unattainable but at the same time viewing something like that can be quite stressful, even though you're aware that it's not real, so I do try to limit it as much as I can" ***Lines 89-94; P5, Female, Age 25***

P5's account portrays somewhat of an internal struggle with herself when she describes her experience on Instagram, stating "in my head I'm like, that isn't real". This degree of self-talk suggests that P5 is trying to remind herself to remain aware that the content she is viewing on Instagram is "unattainable" and not necessarily an accurate depiction of appearance. In particular, she draws upon photos portraying body types and skin complexion as being problematic for fixating on. This is consistent with research that has shown that when individuals with BDD view images of other people, they selectively attend to the features they perceive as attractive of those people (Greenberg et al., 2014; Toh et al., 2015). This fixation can then contribute towards the maintenance of appearance-related distress (Greenberg et al., 2014), which may be reflected in the "stressful" experience P5 expresses. As such, it seems as though P5's self-awareness and usage are related, in the sense that her attempt to regain control through self-restraint on Instagram is also a way to try and manage and control the potential fixations to content online.

Within this theme, it was revealed that a loss of control in viewing the self and others online was a result of the value placed on appearance by participants. Previous research has shown that SNS engagement can become an automatic reaction to cues from the online environment (Wegmann, et al., 2020). In particular, within the present theme, appearance-based images were presented as a visual cue with an explicit demanding character which participants could not disengage from, leading to feelings of low-self-worth and distress in appearance. Subsequently, participants engaged in corrective efforts in an attempt to regain a sense of control in their usage. This suggests that individuals sought to alter their sense of agency as a result to mitigate the negative feelings experienced from their initial loss of agency.

8.4.2 Comprehending appearance comparisons as an individual with BDD

Appearance comparisons are the most commonly reported behaviour in BDD (Anson et al., 2015). Within the present study, all participants drew upon comparisons when comprehending their online experiences. For many participants, comparisons were challenging, and often led to questioning their self-concept. However, for three participants, comparisons also played a safety-behavioural role to protect the self from perceived negative evaluations. These are further explored in the subordinate themes *(i) "It's harder amongst similar people": Wanting the 'normality' of others online, (ii) "Everything about me is so much worthless": Battling with a mind-set of comparisons on Instagram, (iii) "Why am I like this?": The self as different to others online* and *(iv) Protecting the self.*

8.4.2.1 "It's harder amongst similar people": Wanting the 'normality' of others online

Some participants reflected upon engaging in comparisons as a result of wanting to feel normal within themselves. In doing so, participants described engaging in comparisons, whereby they compared themselves to others who were perceived as similar to themselves (e.g., peers; Ho et al., 2016). In P4's account, desire and disappointment is portrayed in her experience of comparing herself to her friends in both offline and online contexts:

"For me it's not always the celebrities and the models, it's seeing my friends looking amazing and thinking that's just a normal girl, she looks amazing and I can't look like that. So I kind of see a model and think, that's not real, that's probably posed and airbrushed and filtered and all sorts, but if I see my friends looking really nice and it's just them walking down the street, and I can never look like that, that's what feels worse. So I think it is also that I can't be on Instagram without following all my friends and then I'm going to see (…) and not just what they look like but what they're doing, like if they're out with their boyfriends, I don't have a boyfriend so that can feel a bit bad, they're out with loads of friends, and I don't have many friends, they're out on holiday, I can't afford a holiday.. It's just this big place for

comparison, isn't it in the end, which for me is harder amongst similar people to me, rather than like a model who (...) I could never be like anyway" ***Lines 96-107; P4, Female, Age 27***

P4's narrative indicates that she perceives a discrepancy between herself and her friends, whereby she highlights the difference between herself and "a normal girl". In doing so, a sense of disappointment seems to encompass her sadness of being unable to fulfil her desire of having the same appearances and lifestyle as her friends, which is conveyed when she states "I can't look like that" and repetition of "I don't have [lots of friends/a boyfriend]", suggesting that her friends represent what she perceives to be the ideal in terms of appearance. Previous literature has shown that lateral comparisons can play a role in increasing self-discrepancy between the actual self and ideal self (Sohn, 2010). In turn, this can determine an individuals' vulnerability to negative emotional states (Higgins, 1987), which is reflected in P4's experience of feeling "bad" and "worse" when viewing her friend's posts. Moreover, although P4 mentions the influence of appearance comparisons on her emotions, she also reflects on missing aspects of companionship and friendship, giving the impression that she is missing something which goes beyond appearance. One characteristic of individuals with BDD is that of increased isolation (Veale & Gilbert, 2014), and although it is not specified in P4's account, this may explain why P4 feels as though she is missing in areas of social relationships. Nonetheless, P4's passage highlights peers as being more problematic to her when using Instagram and suggests that content from those viewed as being more relatable may play a role in influencing discrepancies of her self-actual and self-ideals.

For P7 on the other hand, comparisons to peers were driven through his need to fit in:

"It's never been like I've compared myself to celebrities or people necessarily with, maybe exaggerated physical features um, but for me it was more about like (...) feeling normal? So

the people I would compare myself to on like Instagram were (...) people my age, like in my school erm that you know, shared some (…) common things with me (…) the way I felt like it was, I think even in spite of my obsessions with appearance I (…) was able to acknowledge that the magazines and this and that are all photoshopped and you know the (…) features that people have are exaggerated, but for me it was like I was trying to be normal almost, not necessarily like um like uh muscles or this and that, it was more just like, I want to fit in. Um, so when I would compare myself, it was, I was setting that person as like the baseline, even if they were objectively more physically attractive for this and that like I would set them as this is what I should look like, and then you know, that was a bad, bad place to start for sure, but then I would just (...) you know remember the things about myself I didn't like and then you now, (…) I'd pretty much go downhill from there." ***Lines 369-373; P7, Male, Age 19***

The importance of normality was expressed within P7's account. For P7, his need of "trying to be normal" created the impression that he did not perceive himself as "normal" due to his appearance concerns, and this seemed to be the driving force behind his comparisons online. During his reflection, he acknowledged that he does not compare himself to celebrities, giving the impression that they are superficial, e.g., "photoshopped" and not the target of normality he is seeking to reach. Instead, for P7, Instagram seemed to provide an opportunity for him to seek suitable targets of comparisons, whereby peers were almost objectified in the sense that he found them appropriate comparisons, using them as a "baseline" which he would evaluate himself against. Indeed, previous literature has indicated that individuals who perceive a standard of attractiveness to be self-relevant may use this standard as a basis for self-comparison (Bessenoff, 2006), which seems to be the process reflected in P7's account. Not only this, but his comparisons towards similar others also seemed to act as a trigger in remembering his appearance concerns, suggesting he did not consciously think about his appearance prior to his comparisons. Moreover, he describes this experience as "going

downhill", implying that the preoccupation with his appearance worsened after engaging in comparisons. This created the impression that P7's understanding of his own appearance, alongside the physical appearance of others, produced an affectual experience that contributed to a negative sense of self (Coleman, 2008; Hockin-Boyers et al., 2020).

8.4.2.2 "Why am I like this?": The self as different to others online

It has been shown that individuals comparing themselves to others who are perceived as holding superior qualities can create feelings of body image dissatisfaction and envy (Tiggemann & Zaccardo, 2015; Chae, 2017). Indeed, when discussing comparisons in the present study, participants displayed feelings of appearance dissatisfaction, and expressed confusion in their perceived differences to other people. For P8, comparisons online led her to question her self and her appearance:

"I always compare myself to the people that I see on Instagram like all the time, the features they have, the facial features they have it's just, I think to myself aw why can't I look more like them like, why am I like this like, kind of like that (...) I don't like my nose or my (...) eye bags as well, I don't like how my skin is, I have some acne scars and I look at people on Instagram and how clear their skin is, how like appealing they look more than me, it's just like wow, why can't I look like that, I'm just like this and um yeah, I always compare myself with people like that" ***Lines 81-94; P8, Female, Age 19***

P8 expresses an unhappiness with her appearance after comparing herself to others online. Within this passage, P8 reveals how an unblemished appearance plays an integral role in looking "appealing", however, when describing herself lists a number of perceived blemishes, emphasising her lesser appeal in comparison to people online. It has been shown that when individuals with BDD view images of others, they tend to selectively attend to features aligned with their perceived flaws, and may interpret their perceived flaws as

reflective of personal defectiveness (Greenberg et al., 2014), which could be reflected in P8 repeated questioning of "why am I like this". It is also revealed that P8 only seems to compare herself to people online who look appealing rather than those who may also portray perceived blemishes. This is consistent with literature indicating BDD individuals as selectively attending to the attractive features of other people's appearance (Toh et al., 2015), suggesting that P8's interpretation of her appearance comparisons is based on the choice of appearance-based content that she views on Instagram.

Similarly, P5 expresses frustration within her account when trying to decipher why she perceives herself as different to people online:

"I think well, regardless of how your skin is or your complexion I still think that you're really pretty and then that'll then affect me because I'll think well why can't think that about myself, what makes me so different from them erm and then I try to think about stuff like, well... it's just kind of like a cycle of thoughts that I go through so when I'm viewing something I'll then look at myself and then look back at them and notice like all the little flaws and stuff that don't match up" ***Lines 107-111; P5, Female, Age 25***

P5 draws upon a cyclical pattern of thoughts, reflective of rumination that is often associated with BDD behaviours (Neziroglu et al., 2008; Rabiei et al., 2012), as highlighting the flaws she perceives of her appearance. Through this, she describes an almost iterative process of which she compares her flaws against other people's features online, whereby it is suggested that her differences to others are a result of her features not "matching up" to the features of the people she is viewing, creating the impression that it is the differences between features that create a disparity between her appearance and other people. Indeed, it has been demonstrated within BDD, comparisons can play a role in reinforcing self-focus of appearance flaws (Anson et al., 2015). Therefore, it is indicated that the comparisons P5

engages in go towards maintaining negative self-appraisal in relation to her appearance and perception of others.

For P3, a sense of injustice in the disparity she perceives between herself and others is portrayed:

"On the outset of Instagram I have this general sense of like I'm not good enough, why don't I look like them, it's really unfair, even though the rational side of my brain knows there's all these filters it still don't even look that good with all these filters and you know you can only filter so much and these people have amazing bodies and whatever, like and how confident they are" ***Lines 423-428; P3, Female, Age 31***

P3 describes filters (augmented reality effects to enhance facial appearance) as only being able to do "so much", implying that there is a limit to the extent filters may change an individual's presentation. In particular, she acknowledges the confidence people on Instagram portray, suggesting that she desires to achieve this perceived level of confidence, however, is conscious that filters cannot change her state of being. In this sense, P3's desire to be like others online goes beyond the superficial aspects of appearance.

8.4.2.3 "Everything about me is so much worthless": Battling with a mind-set of comparisons on Instagram

The inability to meet the appearance expectations when comparing to others can lead to the reinforcement of internal image and increased negative appraisal (Anson et al., 2015). In turn, this has been shown to lead to feelings of inadequacy and negative mood if individuals believe they do not meet their desired appearance (Veale et al., 2016). This was reflected in a number of participants, who drew upon their self-worth as being impacted as a result of their comparisons. For example, for P4, the impact of comparisons went beyond negative appraisal of appearance:

Int: *"Can you tell me about how you feel when you do compare yourself?"*

P4: *"I think it's really worthlessness, unloveable-ness, really like deep and (...), for me that comparison always goes way beyond one body part or like, it's never gonna be like aw, my berry's bigger than hers, but otherwise everything's fine, it's never that, it's always so much bigger than that, that everything about me is so much worthless."* ***Lines 158-162; Female, Age 27***

In P4's account, feelings of "worthlessness" are seemingly encompassing of her self-worth as a result of comparing herself to others, creating the impression that she feels defined by her comparisons online. From a self-discrepancy perspective, individuals may associate the failure to reach body ideals with their self-concept (Bessenoff, 2006; Vartanian, 2012), which may be reflected in P4's experience whereby her value of appearance is intertwined with self-worth, which is exacerbated through the engagement of comparisons. For P4, this seems to be a consistent losing battle, whereby the negative affect she experiences is "never" superficial in nature, but rather a despairing personal experience for her whenever she engages in comparisons online.

On the other hand, P5 draws upon the psychological consequences of engaging in comparisons:

"It's really upsetting erm (...) so it can be (...) obviously stressful but more upsetting because (...) I don't know how to explain it, but just like when you're in that mindset of constantly comparing yourself it's... you just feel drained cause it's like well, obviously there's no way that I can ever look like this or you know I just kind of have to accept it" ***Lines 117-121; P5, Female, Age 25***

When comparing herself to others, P5 describes this as being a predominantly "upsetting" experience. She has difficulty in explaining how she feels; "I don't know how to explain it", indicating the consequences of comparisons as being complex and difficult to convey to another person. For P5, the mindset of comparisons is consistent and draining. There is a sense of hopelessness that it conveyed in her admittance in accepting how she looks, suggesting that for P5, it is not a choice to accept her appearance, potentially as a way to try and mitigate the distress felt around her appearance.

One participant claimed the consequences of comparisons were dependent on his mood prior to going online. Previous literature has demonstrated mood to have a significant distal and proximal role in body satisfaction, with negative mood in particular being shown to increase levels of appearance dissatisfaction (Haedt-Matt & Keel, 2011). This is highlighted in P2's account, where the role of mood is described as being two-sided in nature, and the consequences of comparisons are determined by the situational mood he is in when he uses SNS:

"I think my general experience is that any social media with someone, for myself anyway with BDD can, depending on your mood when you access the platform, can affect you very emotionally in the sense that you are feeling very confident in yourself and you're not really struggling with BDD symptoms, it's quite easy to browse through and look and be positive about other people's photos and comment in a positive way, possibly take a photo of yourself and send it (...), but conversely if you're feeling negative and you're having these checking habits that are making you anxious erm social media can definitely affect you by making you think aw I'm not as good as that person, I'm comparing myself to that person (...) you start looking at old pictures and think: wow, I used to look a lot better in that scenario, how can I look like that again (...) so yeah I think it has a noticeable impact on someone like me, you know depending on when I go on into the platform" ***Lines 173-184; P2, Male, Age 32***

In this passage, it is implied that mood can be a trigger for P2's BDD behaviours when online, drawing upon anxiety as leading to self-depreciatory thoughts and monitoring behaviours when viewing and comparing his present appearance to old images of himself online (Veale & Gilbert, 2014). On the other hand, he frames being in a good mood in a positive light, in the context of not struggling with BDD. As such, his account of two separate experiences highlights how "noticeable" these experiences are when he is online, creating the impression that for P2, his situational mood is tightly intertwined with his affective states.

8.4.2.4 Protecting the self

For some participants, comparisons were a way to protect aspects of their self-concept. Within individuals with BDD, comparisons are often associated with monitoring the perceived flaw, to determine where they stand appearance-wise in comparison to others (Veale & Gilbert, 2014; Anson et al., 2015; Teena et al., 2016). However, for three participants, comparisons seemed to play a safety-behavioural role to prevent negative consequences occurring because of their BDD (Veale, 2004). For instance, P1 described comparisons as the following:

"I'm either going to compare myself to someone because I feel like they're better than me or 'cause I feel you you know I'm better than them (...) I feel like it maybe gives me something erm (...) something like to kind of like hold on to and ignore (...) this whole thing that's happening and like my (...) perception of myself and maybe like as a boost of confidence? When I get that boost it's kind of like (...) would I see myself in a you know better version of what actually is, you know" ***Lines 334-344; P1, Female, Age 23***

In this passage, P1 described comparing herself to others not only who she perceives as "better" than herself, but also to those whom she perceives as not holding qualities as good as herself. From this stance, P1 engages in downward comparisons, comparing herself to others

perceived as worse off than herself (O'Brien et al., 2009). This comparison direction has been shown to enhance self-esteem and appearance satisfaction, which may be reflected in P1's increased confidence. Moreover, downward comparisons have been shown to be a protective factor in body image disturbance (Rancourt et al., 2015), which may be reflected in P1's perception of comparisons allowing her to "ignore" the negative perception of herself.

For P4, comparisons were a way to avoid disappointment in her appearance:

"I've thought about this a lot about (...) there must be a gain, there must be something that my mind is gaining from comparing myself [to] other people. I think (..) sometimes it feels like, it's something about keeping myself in my box, keeping myself in my place and telling myself you're not pretty enough and don't ever think that you are, so don't trick yourself into thinking that you're pretty enough because all that's going to happen is you're going to go out there, fancy a boy who's going to call you ugly, because you are, and you're going to wish you hadn't forgotten (...) so, and that's happened before, I guess it's happened to a lot of us, like you feel a bit confident, you go and do something and you get smacked in the face, and you think I wish I hadn't forgotten how, sort of, the way I am (...) so it feels like that's where this comparison comes from, if I keep telling myself that you don't look like her, or her, or her, everything about you is worse than all them [sic] people, then you're not going to be so disappointed when someone else tells you that." ***Lines 114-126 P4, Female, Age 27***

In comprehending her comparison experiences, P4 believes there is a goal to be attained as a result of comparing. In this passage, P4 presents elements of appearance-based rejection sensitivity, whereby she expects rejection and criticism based on her appearance (Kelly et al., 2010). She states engaging in depreciating self-talk to discourage positive self-perception of her appearance to avoid disappointment from others. It has been hypothesised that negative conditioning processes can account for negative appearance beliefs within individuals,

whereby negative comments and appearance teasing elicit a negative response (e.g., shame, anxiety), which then become associated with the initial behaviour that initiated negative feelings (Baldock & Veale, 2019). Moreover, her statement "everything about you is worse than all them [sic] people" may be reflective of social ranking (Veale & Gilbert, 2014), whereby she is gauging her self-worth in regards to others she compares with. However, within this passage, it is implied that she has already confirmed her social ranking, and uses comparisons as a way to maintain her place within her self-ascribed rank. This creates the impression that for P4, comparisons serve as a reminder to stay within her 'social rank' of appearance to avoid and protect herself from feelings of disappointment.

Appearance comparisons online were multidimensional for participants. For many, comparisons towards others were attributed to seeking normality; the desire to feel "normal" and to fit in socially. However, it was also highlighted that the impact of comparisons online went beyond physical appearance. It has been demonstrated that individuals with BDD define themselves by their appearance concerns (Veale, 2004), yet participants within the present study expressed longing for self-confidence and connectedness to others, which was amplified through comparisons to peers who were perceived as presenting these features. Moreover, for some participants, comparisons were a way to protect themselves from the threat of being negatively evaluated by others. In this sense, comparisons were a safety-behaviour engaged in by participants to avoid disappointment in themselves, and to gain reassurance about their appearance.

8.4.3 The value of others' perceptions online

All participants expressed the importance of others' perception on the evaluation of their appearance. As a result, a number of participants voiced having a fear of judgement online regarding their personal profiles and photographs. In addition, it was revealed that feedback from others online played a role in feelings of self-worth. On the other hand, when

participants expressed finding others online as going through similar experiences, they described having a feeling of belonging and support. These experiences are further explored in the subordinate themes *i) the anxiety of judgement, ii) validation from others and iii) finding a sense of belonging and community online.*

8.4.3.1 The anxiety of judgement

Within the interviews, a number of participants expressed feeling anxiety in the context of judgements online. This may be reflective of self-consciousness and a fear of negative evaluation. Whilst this is a main characteristic of social anxiety disorder (SAD), it has also been shown to be present in those with BDD (Kelly et al., 2013). For example, P2 stated:

"With BDD seeing myself in a certain way when that becomes, when you're in a situation where that is quite heavily reinforced by yourself I think you forget that other people don't see it in the same way (...) so the more people you think are going to look at you and see the same that you are (…) on top of that urm is the fear of getting comments about anything erm and I think it's just a great erm I think in your head at that time, at least in my head it's a greater risk of being found out as it were" ***Lines 103-109; P2, Male, Age 32***

In P2's account, his anxiety of judgement stems from a fear of being "found out", suggesting that his BDD is something that is hidden from others. In particular, he expresses concern in that others will see "the same" as he does, highlighting that he perceives himself as different to others, and fears that this self-perception will be exposed. While he acknowledges that this may be due to his own self-reinforcement, implying that he feels a degree of responsibility for the fear that he feels, for P2 the social elements of SNS and opportunity for comments on appearance seem to be the features of SNS that contribute most to his apprehension of judgement.

Similarly, P4 expressed feeling being exposed online as contributing to her fear of judgement:

> *"Yeah I think that's what stopped me from getting it [Instagram] for so long and I still worry about that, it's that sense of when I post a picture, but it takes me ages to post it because I feel like I'm going to regret it straight away, that people are going to see me and I don't like that. I don't erm have that many followers so I'm not going to get that many likes and that feels bad, and then say if I start talking to a guy on Tinder or whatever and then he wants my Instagram I'm like ((gasps)) I've not got that many likes, I've not got that many followers, I don't think I look good in my pictures, I'm just very aware that my presence is there to be seen for people who judge, it feels like a place to be judged"* ***Lines 82-90; P4, Female, Age 27***

Instagram presented a space for P4 to be judged by others. In this passage, it seems as though P4's fear of judgement is a result of how she perceives her self-presentation on Instagram, whereby she implies that social interactive features such as likes and comments are reflective of how others will perceive her. In this regard, the lack of these features is related to her emotional states in a negative manner. Moreover, her awareness of her online presence is suggestive of hypervigilance online (Tasios & Michopoulos, 2017), implying that she anticipates a negative response as a result of judgements of Instagram, particularly if she is aware that a situation (e.g., online dating) presents itself in a way that she is aware of someone viewing and judging her profile. This created the impression that P4's perceived online presentation to others contributed to her anxiety of judgment.

On the other hand, P7 did not express anxiety from judgement online, but rather used judgement from others for their opinions on his appearance, drawing upon the platform Reddit to comprehend his experience:

"Around the height of my BDD, I did an anonymous post on Reddit where I took a picture of myself and like (...) it was something along the lines of, what is wrong with me or like, it was something where I was like, asking other people and I remember on that particular subreddit like (...) trying to identify what was abnormal with me cause at that time I was like: man there's something wrong, but I can't almost figure out what it is" ***Lines 231-237; P7, Male, Age 19***

In this passage, P7 states using the platform Reddit to acquire opinions about his appearance. He expresses confusion and uncertainty regarding the perception of his appearance, creating the impression that he used SNS to comprehend and pinpoint the cause of his ambiguous self-perception. However, in doing so, he specifically asked for judgements on what is "abnormal" about his appearance. Self-verification theory posits that individuals prefer to maintain stable self-views and will seek to obtain feedback from others that are consistent with this perception, even if the perception of themselves is negative (Swann, 2012; Brown et al., 2013). This seems to be reflected in P7's explanation, whereby he seeks others' opinions to identify what is abnormal in his appearance, rather than posting to seek positive feedback on his appearance.

8.4.3.2 Validation from others

According to socio-meter theory, the way individuals feel about themselves is a dynamic and self-regulatory gauge of their relational value, whereby self-worth is assessed through cues of inclusion or rejection within the social environment (Leary & Baumeister, 2004; Burrow & Rainone, 2017). On SNS platforms such as Instagram, feedback through features such as

likes and comments can act as a signal of social acceptance within the online environment (Dumas et al., 2017; Tiggemann et al., 2018). Within the present interviews, two participants described how likes and comments online influenced their feelings around their appearance. For instance, P2 stated:

"If I've posted something like a photo of myself for example and (...) I'm feeling quite negative about my appearance from a BDD perspective, I think I'll be quite preoccupied by it because I want to have likes and positive comments as justification to relieve my symptoms, to relieve my feelings, so that will mean a longer preoccupation with the platform and a longer associated feeling either feeling of increasing relief or a feeling of no change" ***Lines 188-193; P2, Male, Age 32***

For P2, receiving positive comments and likes were a way to alleviate his "negative" feelings around his appearance. In comprehending his experience, he describes likes and comments as a way to justify his appearance, suggesting that for him, these features act as a form of appearance reassurance. However, he also describes the act of posting for feedback as leading to preoccupation with the photo posted, whereby his preoccupation is "associated" with his subsequent feelings. In this sense, the process of posting a photo for appearance validation was presented as an almost iterative cycle, whereby his feelings fluctuated dependent on the feedback received, leading to further preoccupation to try and increase the relief felt regarding his appearance.

Similarly, P8 expressed how positive compliments on her photos made her feel:

"I think it was last year someone said that I looked really good in my pictures so um it kind of made me really happy and it's a weird thing I do, I screen shot the compliment, I screenshotted it because it made me really happy (...), it kind of made me feel like wow, I've actually gotten a compliment like this is really good, it really made me feel like really happy

erm because it came out of nowhere as well. Like I'd get it from my friends of course all the time, but when it's from people I don't know, it makes me feel really, it makes me feel really confident and happy for a while" ***Lines 146-155; P8, Female, Age 19***

For P8, receiving a positive comment seems to provide her with a boost in self-esteem, whereby she expresses feeling "happy" and "confident" in herself as a result of the comment. In particular, the importance of receiving an appearance-based compliment online is highlighted in P8's account, where she describes receiving a compliment as achievement-like, screen-shotting the comment received as a reminder to herself of the positive feelings she felt when receiving it. Within her account, she also conveys an element of surprise when discussing compliments, indicating that she perhaps feels undeserving when she receives praise online. Moreover, P8 states that her happiness and confidence are elevated when a compliment is given by someone she does not know. From a socio-meter perspective, this indicates that P8's feelings are responsive to feeling accepted by others in the context of her appearance (Burrow & Rainone, 2017), suggesting that for her, appearance-based comments are relative to her appearance value.

8.4.3.3 Finding a sense of belonging and community online

Many participants reflected on SNS as a place to find belonging and a sense of community with others also experiencing BDD, or as a place for support and information about the disorder. In this regard, SNS provided an opportunity for their need for belonging to be met (Maslow, 1968; Baumeister & Leary, 1995). For example, P4 stated:

"That sort of sense of community and there's lots of, I think it's shot up tremendously in the last couple of years, that sort of sense of body positivity or feminism erm womanhood and I find that really beneficial, I think I'd struggle a lot more if I hadn't been erm exposed to that sort of positive movement that's on Instagram and I follow lots of people who um like (…)they

do that thing you know when [they] show their natural body and then they show what it looks like when they pose in a certain way, and they're sort of showing you that this is what Instagram is, it's this pose, it' not real erm, so I find that kind of grounds me a little bit, brings me back to real life sometimes" ***Lines 177-185; P4, Female, Age 27***

P4 described the sense of a wider community online in a positive light, whereby Instagram provided a space for her to engage with content promoting body positivity and womanhood. In comprehending her experience, it is implied that she has struggled with her body image and elements of womanhood "I'd struggle a lot more if I hadn't been exposed to that [body positive movements]", for which Instagram has provided her some conciliation through online movements. In this passage, she takes responsibility of following this content, acknowledging that it keeps her "ground[ed]" in her perception of appearances on Instagram. In addition to this, she draws upon the ability to connect with others as providing her with a sense of belonging:

"Being able to keep in contact with people, I guess it gives me a sense of belonging and worth outside of how I look (…) being able to talk to them [friends] over social media and being able to keep in touch with their lives over social media keeps me connected to people and makes me feel loved which I wouldn't have and that kind of helps to stop feeling so bad about how I look, so there are benefits to being on there [Instagram] for sure" ***185-192; P4, Female, Age 27***

P4 expresses the ability to connect with people on Instagram as giving her a sense of belonging and self-worth, suggesting that outside of this, her sense of worth and belonging is based on her appearance. In this, she highlights the meaning and value of connectedness to others in her feeling of being "loved" and indicates that this contributes to mitigating her distress in appearance. Indeed, research has shown that that mutual reciprocity with others

online contributes towards minimising feelings of loneliness and enhancing feelings of belonging with others perceived as being similar as oneself (Naslund et al., 2014). As such, this suggests that P4's social connectedness to others serves as a reminder that her self-concept goes beyond her physical appearance.

Similarly, P5 expressed community as providing an opportunity for support with her BDD:

"I'd say on Instagram and stuff, with the BDD thing it's kind of a way to form a community and see people who suffer from the same symptoms you have and the same issues that you fixate on and stuff and it kind of gives you the feeling of, oh I'm not alone, it's not just me (…) being able to talk to people about it [BDD], obviously I know that kind of falls into the community part again but like I say I found out that I had similar symptoms to this girl who had body dysmorphia so I was able to talk to her about it and ask for help and ask how she was dealing with it and stuff like that, like we both had similar kind of worries and things so that's kind of a positive aspect of it" ***Lines 57-60; 189-195; P5, Female, Age 25***

For P5, Instagram enabled her to find peer support, with another individual going through a similar BDD experience. It has been shown that through reciprocity online, individuals who suffer mental illness can feel less alone and feel supported (Naslund et al., 2014), which is reflected in P5's passage when she states "it's not just me". For P5, connecting with others also provided her an opportunity to seek information on coping with BDD. In this sense, finding similar others online appeared to minimise feelings of loneliness and provide P5 an opportunity to share and learn about her BDD experiences.

On the other hand, whilst P6 describes engaging with others on SNS in a positive light generally, she perceived Instagram in a more negative light:

"I think engaging with other people on social media is nice um, I feel like on Instagram that doesn't really exist because there's like that superficial aspect to it and it's just about like me me me and less about I don't know like humanitarian causes or something like that so I feel like other social media platforms bring me closer to like, the world and humans in general and I'm not like as deluded as much if that makes sense and so yeah, I feel there's more of a connectedness and more grounding" ***Lines 147-152;P6, Female, Age 25***

It has been shown that Instagram can be based more on personal identity as opposed to relational identity, whereby individuals use Instagram for self-promotion, rather than social relationships (Sheldon & Bryant, 2016). This aspect of Instagram seems to be consistent with P6's experience with using Instagram, as she describes it as "superficial" and self-focussed, creating the impression that she becomes "deluded" to the content on Instagram. For P4 to feel connected to others, she needs to feel more involved with wider events. In particular, she draws upon "humanitarian causes", suggesting that being engaged and knowledgeable in the welfare of others around the world is more beneficial for her than the content she comes across on Instagram.

P7 however, described finding a sense of community online as being both a positive and negative experience, in that they can be beneficial for support, but also triggering for past BDD experiences. He draws upon the SNS platform Reddit as enabling the opportunity to find specific, relevant support groups:

"I got it [Reddit] primarily for actually a lot of the support groups they have on there, like I know they have an r slash body dysmorphia ['subreddits'; specific online communities in Reddit] and an r slash BDD forum that I follow and those are, those are (...) those are nice groups" ***Lines 185-188; P7, Male, Age 19***

Within his account, P7expresses using Reddit specifically for the support groups, indicating a sense of responsibility for his choice of SNS platform. SNS support groups have been shown to be beneficial for SNS users, particularly those with anxiety or difficulties with social interaction, as users have more control over the extent they interact with others (Schrank et al., 2010; Naslund et al., 2016). Moreover, although it is not specified within this passage, online peer interactions can lead to perceived benefits of information and social support (Naslund et al., 2014), which may underpin P7's motivation to follow support groups. However, P7 also draws upon a downside to his experiences with SNS support groups:

"It's sometimes a little triggering you know to hear people talking about (...) you know being very convinced of something wrong because I can unfortunately relate to that very much and while I'm not, well I know my obsessions that I do have now and again are a bit well, are irrational it's easy like it would be easy for me to like relapse into that thinking" ***Lines 189-193;P7, Male, Age 19***

In this passage, P7 reflects upon his development of awareness of his BDD to comprehend the challenging experience support groups may present. In particular, his empathy towards others within the support groups seem to "trigger" his BDD thoughts and obsessions. Indeed, it has been shown that learning about others' experiences can arouse feelings of confusion, anxiety, and inadequacy about one's own condition (Ziebland & Wyke, 2012), which may be reflected in P7's expressed risk of relapsing into "that thinking". As such, for P7, SNS can provide the opportunities for finding a sense of support, however, poses risks regarding triggering negative thought processes around his BDD.

Within this theme, participants expressed a fear of negative appearance evaluation as driving their anxiety of online judgement. This is consistent with appearance-based rejection sensitivity, which has been shown to be one important mechanism highlighted within BDD,

whereby individuals expect social rejection based on appearance (Kelly et al., 2010). However, for participants, this seemed to be further amplified in the perception that their online profiles highlighted their presence online, leading to feelings of exposure of their appearance for others to judge. On the other hand, when feedback was positive (e.g., positive comments on a photo), positive feelings in regard to acceptance and relief in appearance were described, creating the impression that feedback was a measure of self-worth for participants. Similarly, finding a sense of belonging was generally perceived as a benefit of Instagram, enabling participants to find information and support through others also going through similar experiences. However, this was also associated with a risk of triggering BDD thoughts, indicating a double-edged nature to online communities.

8.5 Implications

The present findings provide several implications. In particular, within clinical practice (e.g. cognitive behavioural therapy; CBT), personal evaluation of the role of SNS platforms with the patient may be a valuable addition within treatment, and trialling this in future research may be beneficial in establishing the functionality and motivations of the BDD client behind using SNS platforms. This can allow health professionals to go towards targeting the appropriate mechanisms that may perpetuate and maintain symptoms of BDD when using SNS platforms. Moreover, the present study also highlights that hashtag communities have the potential to be triggering, facilitated by the ability of other users being able to comment in ways that may validate problematic appearance perceptions of self. This indicates the need for moderators of these sub-communities to be monitored more closely by the platform, and for more stringent rules to be implemented about how sub-communities are operated, and the type of content within them (i.e., not encouraging maladaptive thoughts/behaviours). In addition, moderators should be transparent with what the sub-community is used for (e.g., for support) and ensure that the content and comments within the community are aligned with the

aims/goals of the community. Nevertheless, findings also highlight that some BDD individuals can successfully navigate online environments. Further research should be conducted to explore the potential of using SNS to aid in the support BDD individuals, and to contribute to developing support in BDD individual's usage of photo-based SNS platforms, such as addressing and guiding them through specific behaviours that may exacerbate their symptoms when using SNS.

8.6 Limitations

Due to the idiographic nature of IPA, one limitation was the small sample size. Although this allows for phenomena to be explored in greater depth, it limits the generalisability of findings to other individuals experiencing BDD, for example, those who experience severe delusional BDD (Mancuso et al., 2010).

In addition, the present study sought to generate a homogenous sample through recruiting individuals who identified living with BDD. However, in addition to those having a clinical diagnosis of BDD, the present study also included individuals experiencing BDD symptoms, but without a clinical diagnosis, which may have influenced the convergence and divergence of experiences. However, it has been shown that subthreshold BDD (where symptoms of the disorder do not meet the full diagnostic criteria) involves the presence of core BDD symptoms and impairment, and can predict clinical manifestations of the disorder (Wolitzky-Taylor et al., 2014). Thus, participants without a clinical diagnosis of BDD were included as they expressed experiencing the core symptoms of BDD and were considered as holding significant experiences that were relevant to the study.

8.7 Conclusion

Findings of the present study have highlighted that SNS platforms, in particular Instagram, can maintain BDD symptoms, predominantly due to attending appearance-based images

online, in addition to self-comparisons and fear of negative evaluation from others online. However, it was also found that Instagram can provide a sense of support and belonging by providing opportunities to connect with others with similar BDD experiences. Exploring the experiences of using SNS from a BDD individual's point of view can therefore provide understanding into the motivations behind the interaction and engagement with image-based platforms and provide insight into developing treatment and support for individuals with BDD, particularly when considering the role of SNS use within the disorder.

CHAPTER 9

Making sense of social networking sites in Body Dysmorphic Disorder: The clinician's perspective

The empirical study presented in this chapter explores SNS in BDD from a clinician's perspective. Whilst the study presented in Chapter 8 shed light onto how BDD individuals experience SNS whilst living with the disorder, health professionals who work with people with BDD form therapeutic relationships with their clients, and can be influential to the outcome of BDD treatment. Given this, understanding the role of SNS from a health professional is critical to understand the factors that may contribute and maintain BDD symptoms in the context of SNS, and to gain insight into understanding the current care given to BDD individuals to help with their symptoms and BDD behaviours.

9.1 Introduction

Body dysmorphic disorder (BDD) is a body image disorder characterised by a preoccupation with a perceived or mild defect in physical appearance, which results in significant distress or functional impairment (American Psychiatric Association, 2013). Preoccupations in appearance generally surround areas of the face, including the skin, hair, nose, eyes and chin, although any part of the body can be involved (Veale et al., 2016). These preoccupations can lead to the engagement of safety behaviours such as mirror checking or camouflaging appearance as a way to manage the negative emotions experienced in connection with appearance, in addition to the avoidance of social situations and of intimacy (Baldock & Veale, 2019). However, whilst it has been demonstrated that pharmacological and psychological therapy-based treatments are effective in the treatment of BDD, many individuals continue to experience significant symptoms of the disorder, highlighting the

need to improve existing understanding of the disorder to enhance outcomes in treatment interventions (Krebs et al, 2017). In particular, it has been posited that SNS may play a role in the maintenance of BDD symptoms, as features such as likes and comments, can act as an avenue for feedback and evaluation on appearance (Senín-Calderón et al., 2020; see Chapters 5 and 8 for discussion). However, understanding the potential role of SNS within a clinical setting is important to understand the potential significance of SNS on BDD symptoms, and to provide further insight into the ways it can be addressed within treatment.

Cognitive behavioural therapy (CBT) is one form of treatment that has been shown to be efficacious for BDD (Prazeres et al., 2013). Within CBT, techniques including social, physical and thought exercises are involved to raise a client's awareness of their emotional and/or behavioural patterns (Malak, 2017). When implementing CBT in BDD treatment, most protocols target BDD-related thought and behaviour patterns, including psychoeducation, cognitive restructuring and exposure response prevention (ERP) (Prazeres et al., 2013). Research that has investigated the efficacy of CBT in BDD in adults found that after treatment, BDD symptoms were significantly improved from moderately severe before treatment to a subclinical range, and that this was maintained at both three and six month follow-ups (Wilhelm et al., 2011). More recent research looking into adolescents with BDD also found that symptoms improved in light of insight, depression and general function, with these treatment gains being maintained after two months (Mataix-Cols et al., 2015), indicating CBT as an effective treatment short term. Studies looking into the longer outcomes of CBT however, have found that whilst improvement is generally maintained over time, there is still some deterioration from the treatment gains made short term (i.e., 1-6 months). More specifically, it has been shown that between one to four years after CBT, about half of BDD clients made limited treatment gains, and also continued to have a chronic condition (Veale et al., 2015). Moreover, it has been shown that after a 12-month follow up after CBT

treatment in adolescents with BDD, suicidality was still present in 8% of participants, and up to 50% of individuals either continued to want cosmetic treatment or sought cosmetic consultations for their perceived flaw (Krebs et al., 2017). These findings suggest that there is a significant proportion of individuals who receive CBT for BDD who continue to experience clinical symptoms in the longer term, remaining vulnerable to a range of negative outcomes (Krebs et al., 2017), and highlight the need to understand the maintenance factors that may be associated with this disorder to improve on existing CBT modules.

Within the context of BDD, a maintenance factor is considered as maintaining the disorder if there is symptom relief when reducing it or removing it, or if symptoms are exacerbated if the factor is introduced or increased (Baldock & Veale, 2019). It has been indicated that safety-seeking and compulsive behaviours in particular may be factors that contribute to the appearance-related threat appraisals and anxiety in those with BDD (Baldock & Veale, 2019). Safety-seeking behaviours encompass strategies that are considered necessary to detect, prevent or minimise the negative emotions experienced in connection with appearance (Summers & Cougle, 2018; Baldock & Veale, 2019), and can include behaviours such as mirror checking, taking photos of oneself, comparisons against others and seeking reassurance about appearance (Veale & Gilbert, 2014). However, whilst these behaviours can offer short-term relief about appearance concerns, they can also reinforce and exacerbate symptoms in the long term through maintaining attentional bias towards appearance concerns and increasing preoccupation with appearance (Veale & Gilbert, 2014; Summers & Cougle, 2018). For instance, it has been demonstrated that mirror gazing in individuals with BDD can trigger an increase in distress and lead to a more internal self-focussed mode of appearance-processing as this activity increased both awareness and preoccupation of the perceived flaw (Windheim et al., 2011).

One factor that may contribute to the maintenance of BDD symptoms is the use of online social networking sites (SNS). Literature regarding body image and SNS in non-BDD populations has found that likes and comments on SNS can reinforce attitudes and behaviours associated with appearance and body image (Tiggemann et al., 2018), whilst comparisons to others may be exacerbated due to the ability to browse appearance-related content (see Chapter 5 and 8 for discussion). Appearance-based content presented on SNS can often portray ideal representations of physical appearance and lifestyles, which has been shown to worsen body image dissatisfaction as a result of a perceived inability to reach the portrayed appearance ideal (Fardouly et al., 2015; Tiggemann & Anderberg, 2020). Similarly, in the context of BDD, comparisons have been shown to be influenced by discrepancies in appearance self-beliefs; the actual self (i.e., the attributes the individual actually possesses) and the ideal or ought self (i.e., the representation the individual ideally wants to possess and the representation the individual believes they have a duty to possess, respectively) (Veale, 2004). When a discrepancy is perceived, this can lead to dejection-related emotions as a consequence of feeling unable to achieve the ideal appearances (Veale, 2004). Not only this, but comparisons can increase this perceived appearance discrepancy, encouraging appearance dissatisfaction (Veale & Gilbert, 2014). Thus, exposure to idealised images of physical appearance on SNS may trigger comparisons in individuals with BDD, increasing both negative appraisal of appearance and self-focussed attention on the image. In addition, features such as likes and comments have been shown to act as a form of approval and validation of physical appearance (Dumas et al., 2017), which may be perceived as a way to gain reassurance of appearance online. However, appearance reassurance can only provide short-term relief of anxiety around appearance. Indeed, it has been indicated that BDD is highly comorbid with social anxiety disorder (SAD) (Fang & Hofmann, 2010), and it has been shown that individuals with BDD will continue to seek reassurance to alleviate feelings

of anxiety around appearance (Salkovskis & Kobori, 2015). Interactive features such as likes and comments may act as a form of reassurance to individuals with BDD, and may contribute to reassurance-seeking behaviour, subsequently maintaining BDD symptoms. Thus, it can be proposed that SNS contain a number of features that may exacerbate and maintain behaviours in BDD and should be an important factor to consider within a BDD client's life in the context of treatment (Ayub et al., 2018).

There is a lack of research that has explored the role of SNS in BDD. Research that has investigated maintenance factors and safety-seeking behaviours in BDD has focussed on mirror checking (Windheim et al., 2011; Silver & Farrants, 2016), comparisons to others in an offline setting (Anson et al., 2015), in addition to grooming, skin picking and camouflaging appearance (Lambrou et al., 2012) (see Chapter 8 for discussion). Moreover, research investigating these factors in individuals with BDD has been based on self-report, and research exploring the experiences of maintenance factors is scarce (Veale et al., 2016). To the researcher's knowledge, there have only been two qualitative studies conducted looking into maintenance factors for BDD. These have explored the experience of mirror gazing (Silver et al., 2010) in addition to exploring appearance-related behaviours more generally, giving insight into the role of grooming and camouflaging appearance in BDD experiences (Oakes et al., 2017). There is limited understanding into the ways in which maintenance behaviours may influence the experience of BDD symptoms. One way to further gain insight and understanding into the role of maintenance factors in BDD is through the perspective of health professionals. Clinicians in BDD are likely to spend a minimum of 10 hours with a BDD patient for low intensity CBT treatments and may continue treating the patient when BDD has an episodic course, or if relapse occurs after treatment (National Institute for Health and Care Excellence [NICE], 2019). As a result, clinicians in BDD possess valuable knowledge regarding the factors that may contribute, maintain and help

BDD individuals with BDD symptoms, including triggers about their appearance concerns, emotional reactions and maladaptive behaviours (Ayub et al., 2018). Thus, clinician's perspectives regarding SNS use can provide insight and understanding into the potential role of SNS in the context of BDD, and shed light on how health professionals experience their clients' SNS use within a clinical setting. Therefore, the present study aimed to explore how health professionals in the field of BDD make sense of their clients' use of SNS.

9.2 Method

9.2.1 Design

Interpretative Phenomenological Analysis (IPA) was employed to explore the experiences of clinicians working with individuals with BDD, focussing on their perspectives of SNS use in the context of BDD. IPA is based on three primary underpinnings: i) phenomenology, which is concerned with understanding how individuals make sense of their experiences (Loaring et al., 2015), ii) hermeneutics, which encompasses a dual interpretation process, whereby the individuals interpret their own experience, and the researcher attempts to make sense of the individuals' experience, and iii) idiography, which pertains to a focus of each individual case before producing general claims (Smith & Osborn, 2015; Love et al., 2020). These principles were important within the present study as they respectively i) allowed clinicians to make sense of their experiences of working with BDD individuals, and was beneficial to explore the meanings they associate with the use of SNS in BDD in their clients, ii) enabled the clinicians to remain close to their experiences of SNS in BDD clients, in addition to allowing the researcher to interpret the meanings the participants brought to their experiences and iii) ensured themes were reflective of participants experiences and sense-making narratives.

Generally, IPA captures perspectives of individuals who directly experience the phenomenon of interest, such as individuals living with a specific diagnosis (La Fontaine et al., 2015;

Larkin et al., 2019). However, it has been recognised that experiences are not solely located within the accounts of those personally living with and experiencing certain conditions or diagnoses (La Fontaine et al., 2015). That is, experiences of the phenomena can also be situated within the accounts of other individuals who belong to the "lived world" of those experiencing the phenomenon of interest (Larkin et al., 2019), and can be used to illuminate broader meaning or consequences of objects and events to understand their mechanisms and dynamics (Loaring et al., 2015; Larkin et al., 2019). Clinicians are situated within the lived world of those living with BDD, enabling exploring the dimensions of SNS use and BDD. Thus, IPA was considered a suitable approach within the present study to explore the experiences of clinicians working with BDD, and their perspectives of SNS use in BDD individuals.

9.2.2 Participants

A purposeful sample of five participants were recruited via email with the following inclusion criteria: i) expert status in BDD treatment, defined as having therapeutic experience in treating individuals with BDD and possessing either a psychotherapeutic qualification and/or doctorate in the clinical field. Email addresses were obtained via a UK-based mental health care provider and via attendance at a BDD conference. Participants consisted of three males and two females, with an age range between 33-64 years (one preferred not to say) (*M*=46, *SD*=14.72*).* Most participants were from the United Kingdom (80%) and professional qualifications included Doctor of Medicine (MD), Doctor in Philosophy (PhD) and Registered Mental Nurse (RMN). Participant characteristics are presented in Table 9.1.

Table 9.1

Clinician demographics

Demographics	N	Percent of total (%)
Gender		
Male	3	60
Female	2	40
Age		
	52	
	35	
	64	
	33	
	Prefer not to say	
Country		
United Kingdom	4	80
United States	1	20
Professional Qualifications		
MD	1	20
MRC	1	20
RMN	1	20
PhD	2	40

9.2.3 Procedure

Semi-structured interviews were conducted to gain insight into clinician's perspectives of SNS use in BDD. Questions were developed to explore aspects of SNS use in BDD within a clinical setting, and experiences of working with BDD clients who use SNS (see Appendix XIII for semi-structured interview schedule). All main questions were associated with follow-up questions to prompt more detailed responses. For instance, the question "Have you

experienced a time where the symptoms of BDD individuals have been affected either positively or negatively through using social networking sites?" contained the follow-up question "Why do you think it had that effect?". Interviews were conducted via telephone (*n*=2) or Skype (*n*=3) between July 2019 – December 2019. Each interview lasted an average of 37.84 minutes (ranging between 33 – 53 minutes).

9.3 Analysis

Interviews were analysed following the stages of IPA (Smith, 2004; Pietkiewicz & Smith, 2014; Alase, 2017; Etough & Smith, 2017). Firstly, each transcript was read multiple times, and initial comments were noted regarding features of potential significance. Secondly, exploratory comments were made for each transcript, focussing on three levels of analysis: i) descriptive, which reflected the face value content of the text, ii) linguistic, which focussed on the language and linguistic features of the participant and iii) conceptual, which encompassed interrogating the data and interpreting the meanings behind what is said by the participant. Notes were then developed into emergent themes which captured a more psychological conceptualisation of phrases within the transcripts. Connections across emergent themes were then made to produce subordinate and associated emergent themes. If themes did not fit into the emerging structure or had a weak evidence base within the data, they were eliminated (Pietkiewicz & Smith, 2014). Finally, conceptually similar connections across each participant were collated before emergent and subordinate themes were relabelled and clustered together to form subordinate themes (see Appendix XIV for example of theme development). Overall, the analysis resulted in five superordinate themes and ten subordinate themes.

9.4 Results and preliminary discussion

A total of five superordinate themes were developed during analysis: i) *the vulnerability for self-appraisal online*, ii) *making sense of constant comparisons*, iii) *going beyond the importance of appearance*, iv) *SNS as a therapeutic tool in BDD treatment* and v) *a clinician's need for understanding*. Each subordinate theme contained related subordinate themes, presented in Table 9.2.

Table 9.2

Superordinate themes and related subordinate themes

Superordinate themes	Subordinate themes
The vulnerability for self-appraisal online	The reinforcement of appearance reassurance
	A concern for the availability of cosmetic alteration
Making sense of constant comparisons	The threat of accessible images online
	"If he could just get the perfect look, then he would feel on top of the world": The significance of comparisons in social ranking
Going beyond the importance of appearance	The value of appearance
	Redefining appearance importance
SNS as a therapeutic tool in BDD treatment	The importance of the "right sort of social media" for treatment success
	SNS as exposure therapy
A clinician's need for understanding	"It's not the whole picture": Elucidating the role of SNS use in BDD
	The "dangerous game" of SNS use: Recognising the motivations of BDD individuals in treatment

9.4.1 The vulnerability for self-appraisal online

It has been demonstrated that negative aesthetic self-appraisal (negative evaluation of appearance) can underlie the maintenance of BDD (Lambrou et al., 2011), which can lead to anxiety and shame around appearance (Baldock & Veale, 2019). As a result, individuals with BDD will often engage in behaviours to alleviate the negative feelings associated with appearance (Baldock & Veale, 2019). Within the present study, participants drew upon aspects of SNS that they perceived as exacerbating the occurrence of self-appraisals of appearance for BDD individuals online. In clinicians' experiences, this mainly encompassed the ability of BDD individuals to seek reassurance from others, which validated negative perceptions of appearances; common cognitions in BDD. This is further explored in the subthemes *The reinforcement of appearance reassurance* and *A concern for the accessibility of cosmetic alteration.*

9.4.1.1 The reinforcement of appearance reassurance

Seeking reassurance is one safety behaviour individuals with BDD engage with to alleviate distress and anxiety around their appearance (Baldock & Veale, 2019). It has been shown that individuals with OCD-related disorders seek reassurance to gain a subjective sense of certainty around their appearance (Kobori et al., 2012), in addition to assessing and monitoring appearance-related threat, such as the negative reactions of others (Baldock & Veale, 2019). Within interviews, SNS was framed as containing features that can encourage reassurance-seeking behaviours in BDD people. For example, P1 states:

"One of the big processes um that reinforces and motivates them to use them [SNS] like Instagram, is quite possibly reassurance-seeking because I understand with Instagram people use likes to approve of an image is that right, lots of likes and I don't know quite how it works [laughs] but that would be my concern as a therapist is that people with BDD are very very very vulnerable to disapproval about their image (..) so my concern would be that they may

spend hours perfecting the image, they put it up on Instagram and then check for how many likes (..) as a form of reassurance-seeking" ***Lines 121-128; P1***

From P1's perspective, seeking reassurance is perceived as one of the "big processes" of using the SNS Instagram. In particular, he refers to likes on photos as being a main concern in driving seeking ressurance around appearance. It has been shown that likes can act as a form of social acceptance within an online environment (Dumas et al., 2017), and thus the number of likes received may be perceived as the extent an indiviual feels accepted by others. Not only this, but indiviuals with BDD are more likely to possess higher appearance-based rejection sensitivity, whereby they readily perceive and react to cues of interpersonal rejection, which are based on appearance (Park, 2007; Ding et al., 2020). This is reflected in P1's experience of BDD individuals being "vulnerable to disapproval" of their appearance. As such, a lack of likes may be interpreted as social rejection by a BDD individual, leading them to become more preoccupied with their appearance concerns (Webb et al., 2015). Indeed, P1 expresses his concern around this preoccupation, drawing on excessive behaviours such as "spend[ing] hours perfecting an image", giving the impression that seeking reassurance online may reinforce maladaptive BDD behaviours.

Similarly, P2 draws upon the importance of likes to individuals with BDD:

"I think that there are ways that social media may impact BDD in terms of first of all having anxiety in terms of having pictures posted up there that they don't have control over, or sort of excessive use of filters and fixing of pictures before they're posted, erm sort of monitoring people's reactions like how many likes do I get to this, I've had patients sort of comment how their mood and their anxiety and their appraisals about their appearance are very dependent on whether the photo gets enough likes" ***Lines 37-43; P2***

Individuals with BDD often experience an intense self-consciousness as a result of anticipating criticism and rejection from others (Baldock & Veale, 2019). P2 refers to this self-consciousness as impacting on BDD individuals, where she comprehends feelings of appearance anxiety in BDD people as being a result of images they are unable to control on SNS, creating the impression that the need for control of appearance is an important aspect for individuals with BDD. Indeed, it has been demonstrated that people with BDD will try to alter the perceived threat of being scrutinised by others by changing appearance (Veale & Gilbert, 2014; Baldock & Veale, 2019) as a way to reduce fear within a situation (Veale & Gilbert, 2014). Thus, the present account implies that the ability to enhance and filter photos is a way for BDD individuals to alter and control their appearance to reduce their "anxiety" of the online situation. Moreover, previous research has shown that people who are high in self-monitoring may view likes as a signal that they are presenting a socially appropriate appearance online (Scissors et al., 2016). Not only this, but it has been demonstrated that if not enough likes are received, individuals feel bad about themselves (Scissors et al., 2016). This may be reflected in P2's excerpt, where she describes BDD individuals monitoring the reactions of others via the number of likes received on photos posted, and describes experiences wherein patients have referred to their mood and appearance perception as being dependent on the number of likes. This creates the impression that SNS can encourage appearance appraisals within BDD as a result of individuals attempting to alleviate feelings of anxiety whilst online.

9.4.1.2 A concern for the availability of cosmetic alteration

Within the interviews, clinicians expressed concern regarding the ability to easily access cosmetic alteration advice on SNS. It has been demonstrated that individuals with BDD (up to 76% of BDD individuals; Crerand et al., 2010; Bowyer et al., 2016) often seek cosmetic surgery as a way to enhance their appearance and alleviate negative feelings towards

appearance (Bowyer et al., 2016). However, oftentimes, this does not “fix” the feature of concern, and results in unchanging or worsening of BDD symptoms (Bowyer et al., 2016). That is, individuals often have multiple concerns, and preoccupation with cosmetically untreated perceived flaws can persist (Crerand et al., 2010). One participant described the ease of cosmetic surgeons commenting on appearance online:

“I’ve met a couple of young people, well there’s a lot of young people who use social media or the internet to be in touch with cosmetic surgeons and describe their issues and upload pictures of people who oh suggest they could have this that that and the other and I’ve had a couple of people who say there are apparently sites where you can put on your image and a variety of different cosmetic industry practitioners, be they practitioners, right through to surgeons, will comment on things that they feel can enhance your appearance” ***Lines 38-44; P4***

P4's situates his perception of online cosmetic advice in his experiences of working with "young people", creating the impression that it is younger individuals with BDD who seek advice from cosmetic practitioners. This is consistent with previous research that has indicated younger individuals (aged between 18-35 years) as presenting more preoccupation with their perceived flaw and a desire for surgery (Ziglinas et al., 2014; Higgins & Wysong, 2017). In this passage, the use of SNS "to be in touch" with cosmetic practitioners is framed as an active decision to receive comments and advice on enhancing appearance for individuals with BDD. It has been demonstrated that a high proportion of individuals with BDD seek opportunities for cosmetic surgery as a way to improve and ‘fix their perceived flaw in appearance’ (Bowyer et al., 2016). Thus, it is suggested that individuals with BDD seek online cosmetic consultancy as a way to gain advice on how to improve appearance. However, P4 also states:

"It's sort of validated the sense that the person with BDD is (...) ugly and they require changes so it's more evidence that supports they are er uh really not attractive and therefore need intervention and therefore justified in their views that they shouldn't go out and they should camouflage, they should cover up and so forth, so it has been validating rather than distressing" ***Lines 49-59; P4***

In this passage, P4 comprehends BDD individuals' seeking cosmetic advice as a form of seeking validation for their perceived appearance flaws, stating feedback from cosmetic surgeons as being "evidence" for their appearance. In particular, he draws upon their desire to seek justification of their perceptions of their appearance. Self-verification theory proposes that individuals seek to obtain feedback from others that is consistent with their self-views, even if their self-views are negative (Swann, 2012; Brown et al., 2013). This seems to be reflected in P4's perception of gaining feedback from cosmetics surgeons online. Moreover, he emphasises the reception of this verification as "validating" as opposed to "distressing" for BDD individuals. Indeed, it has been shown that when individuals receive verifying feedback, they feel more understood (Campbell et al., 2006), giving the impression that seeking feedback from cosmetic surgeons is affirmation for BDD individuals' BDD-related behaviour. For P3, cosmetic advice online was of great concern:

"I definitely remember coming across somebody who did (..) who found an app where supposedly the audience (...) would be able to provide free consultation if you upload a picture you get a free consultation or one operation that they think you should have (…) I mean it's really really (..) I mean if you think, it's terrible and also it's just again a way of (..) it's understandable because it's their way of getting some help, like I'll just get this thing and if someone is agreeing with me then there's something there that I really need to fix and there's someone telling me I should um (..) but obviously as a very vulnerable group of people it's a very (..) it's a very dangerous website and with BDD can be used in the wrong

way and if so one has to wonder why are they doing this, like not the BDD patients but surgeons you know (..) what's in it for them" ***Lines 134-145; P3***

P3 recollects meeting a BDD individual who had experienced using a cosmetic consultancy application. During this excerpt, she seems to empathise with BDD individuals in stating "it's their way of getting help", however it is implied that appearance consultancy online is not beneficial to individuals with BDD due to their vulnerability in appearance. That is, it has been shown that individuals with BDD are especially sensitive to appearance feedback, which can lead to the exacerbation of BDD symptoms due to an increased focus on their appearance (Lambrou et al., 2011). Indeed, P3 emphasises her concern towards online cosmetic advice, with the use of evocative terms "terrible" and "dangerous", reflecting the risk appearance feedback from these types of online consultancies may pose to BDD individuals. In addition, she also places responsibility on the cosmetic surgeons behind the SNS cosmetic consultancy pages, questioning their motives behind the cosmetic feedback, suggesting that they are only "in it for them[selves]". However, it has been demonstrated that 84% of plastic surgeons admitted to not recognising a diagnosis of BDD until post-operation (Sarwer, 2002; Sweis et al., 2017), suggesting that the presence of BDD individuals may not be recognised within an online environment.

P1 also expressed concern around cosmetic surgery in BDD:

INT: "Alright, is there anything else that you'd like to add to what we've discussed?"

P1: "I don't know if there's an interplay between cosmetic surgery and use of Instagram, I don't know I really don't know, but I do think that (…) [cosmetic surgery](is) on the rise massively erm (..) and that's devastating you know if you're in the field trying to keep BDD (..) the normalisation of cosmetic procedures, is something which I've seen increasing in the last couple of years (..) what I'm hearing more and more of I think from younger people

coming in for BDD is just the (..) I suppose er how do I put it er smart (…) cosmetic surgery, the sort of things that are becoming a little bit more accessible erm the products that you know can erm (..) all too easily fall into a BDD sufferer's hand and (can) be used completely in the wrong way, I think that that's going to be a big concern for us" ***Lines 376—388; P1***

In this passage, P1 conveys uncertainty in the association between Instagram and cosmetic surgery in his repetition of "I don't know". However, he expresses certainty in the rise of BDD individuals' seeking cosmetic procedures, drawing upon personal observations. In particular, he describes the "normalisation" of cosmetic procedures as being "devastating", drawing upon the accessibility of cosmetic alterations in particular as being problematic. Indeed, it has been shown that due to advances in technology, cosmetic procedures are safer, less invasive and cheaper, with individuals being less anxious and more likely to consider cosmetic surgery to alter physical appearance (Edmonds, 2007; Furnham & Levitas, 2012), which is likely reflected in the "normalisation" P1 remarks. He perceives this normalisation as problematic and concerning for people working in the field of BDD, indicating BDD as a contraindication to cosmetic procedures.

Within this theme, participants expressed concern regarding the vulnerability of self-appraisal online for BDD individuals. In particular, seeking reassurance online was highlighted as having different functions within BDD. Reassurance through the form of likes from others online was perceived by participants as reinforcing a need for appearance acceptance (Scissors et al., 2016). Within the context of seeking reassurance from cosmetic surgeons, reassurance was a form of validation and self-verification for appearance concerns (Swann, 2012; Brown et al., 2013). However, it was highlighted that seeking reassurance may lead to detriment in appearance self-appraisal, leading to more detrimental outcomes if perceptions of appearance were validated, suggesting that seeking reassurance online may reinforce maladaptive BDD behaviours for individuals with the disorder.

9.4.2 Making sense of constant comparisons

Appearance comparisons have been demonstrated to be one of the most common and problematic behaviours in BDD, leading to negative appearance evaluations and ultimately increased distress around appearance (Lambrou et al., 2012; Anson et al., 2015). Within interviews, participants drew upon features of SNS that may encourage appearance comparisons, in addition to the motivations of appearance comparisons online. These are further explored in the subthemes *The threat of accessible images online* and *"If he could just get the perfect look, then he would feel on top of the world": The significance of comparisons in social ranking.*

9.4.2.1 The threat of accessible images online

Within interviews, participants believed the accessibility of appearance-based images to other people online as being particularly problematic for comparisons in BDD. Indeed, SNS is accessible at any time, and appearance-ideals may be more salient due to the browsing and interactivity of content with other users (Perloff, 2014; Tiggermann & Anderberg, 2020). In comprehending the threat of accessible images online, P3 compares SNS to traditional media:

"Before Instagram or any apps um social media um the their access was a lot more limited so if you wanted to compare yourself to super models you would have to buy Vogue or a magazine, and that would involve you know spending money and that would involve you know magazines coming out much less frequently and the images (..) you had a lot less access to certain images than you do now but with social media you're constantly surrounded by those images and constantly comparing yourself with those images and you know the feeling of inadequacy is probably a lot more there than it was before just because those images weren't as readily accessible" ***Lines 48-55; P3***

In P3's account, the accessibility of "certain" images on SNS is perceived as encouraging comparisons in BDD individuals. In particular, she draws upon "supermodels" as being problematic for comparisons within both traditional and SNS media. However, whilst traditional media generally provides SNS users with the opportunities to compare appearances to supermodels (Fardouly et al., 2017), it has been posited that upward comparisons (comparisons to others perceived as holding superior characteristics) may be more detrimental when comparisons are made to peers on SNS as they are perceived as more relatable than models (Fardouly & Holland, 2018). Nevertheless, research has also indicated that comparison effects are comparable across both traditional and SNS media, which would explain P3's association of appearance comparisons to supermodels. Not only this, but she expresses that comparisons via SNS are more likely to heighten feelings of "inadequacy" within BDD individuals. This is consistent with research that has demonstrated comparisons to lead to feelings of insecurity and lower satisfaction with self-appearance (Kim & Chock, 2015; Chua & Chang, 2016), giving the impression that comparisons online may exacerbate negative feelings within BDD.

P3 also expresses filters on images as also having an impact when comparing on SNS:

"The event of filters will have made a big difference as well because I mean initially pictures weren't so much touched [up] as much as they are now and for somebody with BDD that really does play into the idea of why do I not look like this and fuelling that anxiety and those obsessions" ***Lines 56-59; P3***

For P3, filters seem to play an important role in "fuelling" BDD symptoms. Indeed, it has been shown that individuals on SNS will enhance their appearance on SNS, presenting an idealised version of themselves (Fardouly et al., 2017). However, this can lead to viewers comparing themselves to the idealised presentation of appearance, leading to increased body

dissatisfaction (Kleemans et al., 2018). In particular, P3 states that filters can lead to an individual with BDD questioning their inability to look the same as others online, leading to feelings of "anxiety" and appearance "obsessions". From a self-discrepancy perspective (see Chapter 8 for discussion), this suggests that individuals with BDD may view filtered, idealised images, leading to an increased perceptual gap between how they perceive their appearance and the way they ideally want their appearance to be (Sohn, 2010). In turn, this can lead to individuals associating failure to reach their appearance ideal with their self-concept (Vartanian, 2012), which may be reflected in P3's description of comparisons exacerbating feelings of anxiety in BDD. This suggests that the exposure to potentially enhanced and edited photos online may exacerbate comparisons, appearance preoccupation and anxiety around appearance in BDD people.

For P2, comparisons online were perceived as being driven by the "culture" of idealised images on SNS:

"I think social media can potentially really sort of (..) up the ante in that now we are in this cultural spot where we only post photos that we find really attractive of ourselves, you know people tend to get the perfect photo before they post it, and this is not even people with BDD, just like sort of the culture around social media broadly right now and you know, we have all these filters where you can easily sort of like you know (..) blur the contours and like fix appearance (..) and so I think that even the photos that people are posting of themselves in the general population don't reflect people's true appearance" ***Lines 63-74; P2***

In P2's account, she expresses that the "culture" of perfected appearances online extends more widely than to individuals with BDD, creating the impression of appearance presentation online as being a wider societal issue. From a sociocultural perspective, SNS can be a powerful medium for messages around appearance, due to the ability to interact with

friends, family, in addition to celebrities, which can go towards supporting appearance ideals and societal standards (Santarossa & Woodruff, 2017), which represents the "culture" P2 is referring to. Moreover, P2 seems to blame the ability to perfect and "fix" appearance with filters as exacerbating appearance standards online, stating that these images "don't reflect people's true appearance". This is consistent with previous body image research that has shown individuals use filters and SNS editing to highlight their best features and hide their imperfections, creating an image that is closest to the ideal appearance (Chua & Chang, 2016). For P2, this ability for peers to be able to enhance their appearance online was perceived as particularly problematic for people with BDD, stating:

"We used to know you know like models and advertisements were doing that [fixing appearance/ using filters] (..) whether emotionally we could separate ourselves and like remind ourselves is a different story but we at least intellectually knew that models were doing that. But now on social media even our peers are posting those like perfected images and so I think (..) I think it's a perfect sort of environment for comparison in a way in BDD and I think that it's probably (..) I think it makes things even harder in the sense that like not even comparing to what are accurate images or realistic images, but just with perfected images and people may not really think about that" ***Lines 74-82; P2***

In this passage, P2 seems to draw a collective experience with both traditional and SNS media, reflecting upon individuals viewing appearance images as a collective process. In doing so, she views the difference in traditional and SNS comparison as the ability to "separate" and acknowledge that appearance-based images are not representative of real physical appearances. Not only this, but she draws upon the peer element of SNS as making comparisons more difficult to disentangle from what is real, creating the impression that this may drive comparisons within BDD. It has been shown that peers are able to construct images of themselves that are representative of societal norms of beauty (Chua & Chang,

2016), and from a social comparison perspective, it has been shown that lateral comparisons (i.e., comparisons to others perceived as similar to themselves, such as peers) (Ho et al., 2016) can lead to increased body image dissatisfaction as an individual perceives this target of comparison as more attainable in comparison to that of celebrities (Fardouly et al., 2015). This creates the impression of the perceived attainability of appearance images on SNS for individuals with BDD as encouraging and proving the "perfect" opportunity for BDD comparisons.

For P5, comparisons were perceived as one factor among several that play a role in BDD:

"I think it's just one part of the jigsaw (…) the social media stuff (..) in some people it [comparisons] may be very dominant because they're doing it all the time (..) in others, it's not so important (..) they may actually be avoiding social media because it's too overwhelming" ***Lines 55-58; P5***

For P5, comparisons in BDD are part of a "jigsaw". This metaphorical choice creates the impression that comparisons are one factor among several that may play a role in BDD. Within this excerpt, P5 describes comparisons as dependent on the individual. This may be explained by the internal goals, i.e., the psychological states around thoughts, feelings, and memories an individual may have towards comparing to others (Baldock et al., 2012). That is, individuals who are guided internally to try and feel better about their appearance by comparing their appearance to others may feel the need to compare until they feel they have achieved their goal of feeling better about their appearance, which may be reflected in P5's description of comparisons' potential to be "dominant". However, it has also been shown that BDD individuals may avoid situations which are perceived as threatening to their perceived appearance or distressing (Veale & Riley, 2001; Baldock & Veale, 2019), which may be implied in P5's account, whereby he describes SNS as potentially "overwhelming" to

individuals with BDD. This indicates that the comparisons on SNS for BDD may be dependent on the internal goals that guide BDD behaviour.

9.4.2.2 "If he could just get the perfect look, then he would feel on top of the world": The significance of comparisons in social ranking

It has been indicated that individuals spend much time comparing themselves to others as a way to monitor their relative social standing (Boksem et al., 2012). However, within BDD, it has been posited that this comparison-based monitoring may become overly self-focussed (Gilbert & Veale, 2014). Within the present study, participants drew upon the different motivations BDD individuals may have for engaging in comparisons for social ranking in an online space. For example, P5 stated:

"You may compare it against other printed media or on people on the television, or against others' photographs in the social media or advertising boards or whatever, there's constant comparing ranking. So most people with BDD tend to rank themselves at the bottom, and just want to be normal and fit in, but there are some people who tend to understand and believe that they are (..) sort of (..) middle ground and want to be at the top (…)[gestures with hands] but at the moment a large majority of BDD people see themselves down there and just want to be normal (…) and it's mainly internal shaming in terms of that ranking, in terms of comparing against er (..) err the view of yourself and to the standard that you believe you need to be" ***Lines 37-43; 45-47 P5***

Within this passage, P5 describes comparison ranking as "constant", creating the impression that it is a continuous process when individuals with BDD compare themselves to media images. From P5's perspective, comparing for social ranking is due to an individual's desire for normality. Within his account, he describes the perceptual gaps individuals with BDD may perceive themselves as being in, in comparison to others, which is reflective of self-

discrepancy (Higgins, 1987). That is, it has been shown that comparisons with others may increase the desire for self-improvement and self-enhancement (Sohn, 2010). However, this can lead to a larger perceptual gap between how an individual perceives their appearance and how they want their ideal to be (Sohn, 2010). As a result, this can lead to a vulnerability to experiencing negative states (Higgins, 1987), which may be reflected in the "internal shaming" P5 refers to. P5 goes on to state:

"The functional understanding of the role of comparing and ranking is that if you know that you are down here all the time [gestures] then you will take evasive submissive action to avoid being rejected (…) so it's a safety behaviour to prevent worst things from happening, even if it has unintended consequences of being constantly down, depressed, anxious about people attacking you an so on (..) I think it's still, in the short term, a strategy to try and keep yourself safe and regarded as a safety behaviour" ***Lines 75-81; P5***

Within this excerpt, P5 describes comparisons and social ranking as being a safety behaviour within BDD. Safety behaviours are behaviours that are engaged in to detect, prevent or minimise the negative emotions BDD individuals may experience in connection to appearance (Veale, 2004; Summers & Cougle, 2018). This is consistent with P5's description of engaging with comparisons and social ranking as a way to "avoid being rejected", in addition to his description of fear of being "attack[ed]" by others, which may be reflective of BDD anticipation and fear of being negatively criticised about their appearance by others (Baldock & Veale, 2019). However, he also draws upon negative "unintended consequences" of engaging in such behaviours, creating the impression that BDD individuals do not realise such strategies may be detrimental. Indeed, this is consistent with previous research which has demonstrated safety behaviours as leading to increased distress as a result of increasing both preoccupation and awareness of the perceived flaw (Windheim et al., 2011). Not only this, but it has also been demonstrated that whilst safety behaviours can offer short-term relief

of negative emotions around appearance, they can also serve to reinforce and exacerbate symptoms in the long term (Baldock & Veale, 2019; Summers & Cougle, 2018). This suggests that comparisons and social ranking online may play a role in the maintenance and exacerbation of BDD symptoms.

Similarly, from P1's perspective, comparisons for social ranking are viewed as a constant process:

"He put everything into this question you know of looking just right and (..) would compare himself all the time to work out his ranking. So talking to him, I know that he would do this (..) talking to people, he would look at them in certain ways which wasn't the normal way that we look at people you know, he would spend an excessive time looking between the eyes, the nose and the mouth and not everything in the whole, because he was trying to work out where is he in terms of the social status (..) is he, you know down in the pits there or is he at the top of the tree in terms of physical perfection" ***Lines 348-355; P1***

P1 views the comparison experience through the lens of one of his clients. In doing so, he describes the process of looking at others as not "normal", but instead as spending an "excessive" amount of time focussing on specific features on the face. Whilst P1 reflects on this account within a face-to-face context, previous research has also shown that individuals with BDD selectively attend to attractive features of other people when viewing images of their faces (Greenberg et al., 2014; Toh, et al., 2015). Not only this, but it has been demonstrated that BDD individuals engage in more detailed evaluation of physical features as opposed to holistic evaluations (Feusner, et al., 2010), which is reflected in P1's account whereby his client does not view others as a "whole". This created the impression that when trying to determine their social ranking status, individuals with BDD focus on the features they perceive attractive in others when comparing. Moreover, it was implied that social

ranking was driven by the desire to achieve "physical perfection". In particular, P1 also stated:

"He said to me if he could just get the perfect look, then he would feel on top of the world, he would feel on top of that the hierarchy, you know he would come into the top slot in terms of social ranking and then everything would fall into place. Because I think that there's a belief that's emerging um (..) which again is just my kind of erm (..) anecdotal observation that people, especially young people believe that if they look just right, then in other people's eyes, they would go up the league if you like in the social ranking scale (…) and that seems to be driving motivation for people and perhaps that's how they use Instagram" ***Lines 357-365;P1***

From this account, the ability to achieve the "perfect look" seems to be strongly associated with feelings of accomplishment. In particular, it is described that for an individual with BDD, "everything would fall into place". This may be explained by previous vicarious learning whereby individuals have observed people being praised for their appearance, or they have been taught that attractive individuals are more likely to succeed and have social advantages (Frevert & Walker, 2014; Baldock & Veale, 2019), and as a result, leading BDD individuals to place greater importance of their appearance in their identity (Lambrou et al., 2011). Indeed, perfectionism encompasses self-oriented perfectionism, whereby an individual holds excessively high personal standards for themselves, in addition to socially-prescribed perfectionism, whereby an individual has a belief that others hold high standards for the individual (Hewitt & Flett, 1991; Krebs et al., 2019), and it has been shown to be an important cognitive process in body image dissatisfaction and BDD (Hartmann et al., 2014). However, it is implied that the perfect look is not just a way for a BDD individual to determine their social standing, but also for others to view them as higher in social standing as well. Indeed, BDD individuals often adopt a 'threat' mode that can be characterised as an

experience of themselves as seen from an observer's perspective "in other people's eyes" (Baldock & Veale, 2019). Thus, it could be suggested that the drive to attain the perfect appearance is due to avoiding negative judgement or rejection from others for being perceived as low in social standing on SNS.

In this theme, SNS was perceived as encouraging BDD comparisons in a number of ways. In particular, the use of filters to enhance, fix or hide blemishes was attributed to exacerbating appearance ideals online (Chua & Chang, 2018), and was perceived as making it difficult for individuals to disentangle real vs. constructed images of others. Moreover, comparisons were also perceived as a way for BDD individuals to socially rank themselves in comparison to others, indicating social ranking via comparisons was a way to pursue a feeling of success and normality in oneself. In this sense, comparison social ranking was viewed as exacerbating BDD symptoms through attempting to avoid negative appearance judgement or rejections; however, was viewed to also serve as a way of increasing preoccupation and awareness of the perceived flaw in BDD individuals (Windheim et al., 2011).

9.4.3 Going beyond the importance of appearance

For individuals with BDD, an idealised value of appearance can develop into the most important aspect of the individual in defining themselves and their self-worth (Veale, 2002; Baldock & Veale, 2019). Within the present study, participants drew upon the value placed on appearance by individuals with BDD, and the ways in which SNS may reinforce this importance. Moreover, participants expressed the need to reduce the importance placed on appearance as a way to reduce the attention placed on the perceived appearance flaws. This is further explored in the subthemes *The value of appearance* and *Redefining appearance importance.*

9.4.3.1 The value of appearance

Due to the nature of the disorder, individuals with BDD are likely to value attractiveness in appearance, in addition to placing greater importance of appearance on their identity and self-worth (Buhlmann et al., 2008; Lambrou et al., 2011). Within interviews, participants drew upon the value placed on appearance by BDD people, and described how SNS may play a role in reinforcing these values. For instance, P1 stated:

"*What defines BDD is the excessive preoccupation of it and the over-valuation of appearance. And although I don't use Instagram I was talking with some colleagues just the other day and they were explaining to me how Instagram works [laughs] and I understand that it's all about images and this is what we're trying to get away from with people and how they erm (..) see themselves to how they value themselves (…) it's all about the image and there's a lot of perfectionism involved so a sufferer of BDD is not only over-valuing appearance, but excessively worried about it too (…) so I think for the medium that emphasises the image above everything else erm that makes up an individual is very likely to reinforce erm an excessive preoccupation with appearance"* ***Lines 72-76; 78-82; P1***

From P1's perspective, he draws upon the image-based environment of Instagram as reinforcing the preoccupation of appearance in BDD. It has been shown that photos on SNS can often present appearance ideals, portraying flawless physical appearances (Tiggemann & Anderberg, 2020) that may provoke preoccupation due to increasing awareness of the individuals' perceived flaw in appearance (Veale & Gilbert, 2014), suggesting that SNS may encourage perfectionistic appearance tendencies in BDD. Indeed, individuals with BDD can over-value their appearance, further intensifying the distress caused by their perceived flaws (Blakey et al., 2016), which seems to be reflected in P1's account of excessive worry in BDD. For P2, the value of appearance was also perceived as being reinforced by SNS:

"People are always so focussed in putting pictures on there and putting beautiful pictures on there I think again can reinforce the belief system that my appearance is really important, my appearance is another way that people are evaluating my value, I have to look perfect at all times (..) I think it can reinforce those unhelpful beliefs in BDD" ***Lines 253-257; P2***

From P2's perspective, the value of appearance is reinforced by the "beautiful pictures" uploaded by other users on SNS. Indeed, it has been shown that users will tend to only upload photos that they look best in (Manago et al., 2008; Tiggemann & Slater, 2014) and spend time and effort to enhance and edit images to make them look better (Chua & Chan, 2016). In this account however, it is implied that for an individual with BDD, photos that they post are perceived as being evaluated by others. More specifically, appearance is seemingly intertwined with their value. From a cognitive-behavioural perspective, observations of others making comments on appearance to either oneself or others can lead individuals to associate their appearance with their self-worth (Baldock & Veale, 2019), which may be reflected in the "belief system" and evaluation of self-value from others P2 refers to. Not only this, but P2 creates the impression that for people with BDD, evaluation of appearance is concerning, motivating them to "have to look perfect at all times". This is consistent with previous research that has demonstrated individuals with BDD possess a fear and anxiety that others will negatively evaluate their appearance (Kelly et al., 2010), suggesting that SNS may heighten BDD anxiety around their appearance in the fear they are being negatively evaluated by others.

On the other hand, P3 comprehends her knowledge of BDD appearance value from the perspective of individuals who are housebound:

"For the kids that are housebound, and not having any social contact between people, and the reality that they see is the reality that they see on social media and TV programmes like

Love-Love Island and that can really skew their perception of what (..) how important appearance is and how (..) people appear and what is realistic (..) in real life"

Lines 82-86; P3

P3 reflects upon more extreme cases of BDD, whereby individuals may be housebound due to avoidance of social situations (Phillips et al., 2004; Phillips, 2014). From this perspective, she draws upon both TV media and SNS as being the only "reality" these BDD individuals experience, influencing and "skew[ing]" their perception of body image in real life outside media. Indeed, media has been shown to promote body ideals through both direct and indirect messages of praise for accepted appearances (van den Berg et al., 2002; Huxley et al., 2014), and observations of these messages can lead individuals to form a perception of what is accepted, unaccepted and normal within society (Marwick, 2012; Tiggemann & Anderberg, 2020). Thus, P3's account suggests that individuals who are exposed to appearance ideals on SNS, without the ability to observe realistic body image, may create an over-valued perception towards body image that is perceived as accepted in society.

9.4.3.2 Redefining appearance importance

Within interviews, participants considered ways in which BDD individuals could be encouraged to broaden their perceptions around the importance of appearance. In particular, they drew upon the types of content BDD individuals should be encouraged to look at, in addition to the ways in which they interact with SNS, as a way to redefine the value placed on appearance. For instance, P3 stated:

"Having other people that are not just Kim Kardashian that are very focussed on how they look and emphasising this idea that appearance is most of you (..) so trying to introduce other role models that take that importance a little bit away from appearance umm (..) so that's another another thing that we might try and do (..) and then also try and ask them you know

(..) if you're looking at a person not to be so assuming so if a person with BDD has severe concerns about their hair and a lot of the comparison is happening around the hair then kind of practicing taking in the whole picture and also trying to think a little bit more beyond where the picture comes from and also a little bit more beyond what the person is like (..) so that the person doesn't automatically zoom in and channel in hair cause because it all just becomes about the hair" ***Lines 202-212; P3***

For P3, redefining appearance importance encompassed attempting to reduce the focus of appearance. She states trying to introduce BDD clients to "role models" that place less importance in appearance. Although it is not specified what these role models may present, recent movements on SNS, such as 'Instagram vs. reality', provide content to dissuade appearance importance by reminding users that appearance ideals on Instagram are often enhanced and do not portray real physical images (Tiggemann & Anderberg, 2020), which may reflect the dissuasion of appearance importance P3 suggests. Moreover, for P3, practicing holistic perception of an appearance-based photo may also go towards mitigating importance placed on appearance and the perceived appearance flaws. This is reflective of perceptual retraining often utilised in CBT, which attempts to reduce selective attention towards details such as appearance flaws (Wilhelm et al., 2014). This type of retraining has been predominantly used in the context of mirror gazing (Wilhelm, 2010; Beilharz et al., 2018), and indicates that it may be beneficial in the context of SNS in redefining importance placed on appearance, and encouraging individuals to think beyond their appearance flaws. In a similar vein, P4 states:

"We also get people to use social media to read and explore a bit about other folks who've had BDD and their feelings and experiences so we get them to look and research more positive pieces about social media, I really admired [BDD speaker] about how Lizzo was an inspiration to her, that would be a very healthy thing to redirect someone who has a really

you know not a classical beaut- you know physique that can be considered beautiful and yet she's a very beautiful and positive individual so you can get people to research a probably wider way of appreciating beauty and self –perception" ***Lines 200-208;P4***

P4 reflects upon previous experiences with clients, whereby they were encouraged to speak to others with BDD about their experiences, as well as researching the positive elements of SNS. Guiding individuals to seek "positive" content around SNS created the impression that as a clinician, he encourages BDD patients to have control in their treatment and redefine their perception of appearance. This is reflective of psychoeducation in CBT. Psychoeducation is the process of informing and educating clients about BDD, including the factors that may contribute towards its maintenance, allowing the client to better understand their symptoms and giving them an active role in monitoring the triggers that may maintain their BDD (Ayub et al., 2018). Thus, in the context of P4's account, addressing SNS within psychoeducation may be beneficial in making the client aware of the ways SNS can be used in a way that is beneficial to their symptoms. Moreover, P4 also describes how unconventional physical beauty may be beneficial for individuals with BDD to appreciate broader beauty and "self-perception", suggesting that redefining appearance value in BDD should encompass a broader acceptance and appreciation of attractiveness. Within CBT for BDD, cognitive restructuring can be adopted to encourage BDD clients to learn to modify deeply held core beliefs (Wilhelm et al., 2015). From P4's account, it is suggested that celebrities who may present unconventional beauty may be beneficial in encouraging a "wider way of appreciating beauty" and that this may encompass a more "positive" form of SNS that is advantageous to address within BDD treatment.

Within this theme, participants highlighted the importance placed on appearance by BDD individuals, drawing upon the exposure to idealised appearance images on SNS as reinforcing appearance values. It was also suggested by one participant that the anxiety of evaluation by

others online may encourage the beliefs of a need to look "perfect" online. As a way to mitigate the importance of appearance, participants reflected upon perceptual retraining strategies, in addition to encouraging BDD patients to share experiences with others with the disorder and seeking positive people and content that may not conform to beauty standards.

9.4.4 SNS as a therapeutic tool in BDD treatment

Despite discussing the ways in which SNS may reinforce and exacerbate symptoms of BDD, participants also drew upon the ways in which SNS may be beneficial for individuals with the disorder, and considered the potential of utilising SNS within treatment. Specifically, participants drew upon encouraging viewing content that was not appearance-focussed, and using SNS as a form of exposure therapy. These are further explored in the subthemes *The importance of the "right sort of social media"* and *"Towards a capacity of SNS in treatment".*

9.4.4.1 The importance of the "right sort of social media" for treatment success

Within interviews, some participants reflected upon benefits of SNS use within BDD. In doing do, they drew upon encouraging using the "right sort of social media" as a way to help mitigate the negative feelings and potential isolation of BDD. For instance, P4 stated:

"We have to remember that social media can be used to be put in contact with you know, good contact, peers, charities, cause organisations you know other sorts of influencers from social media you know, websites that might get you interested in you know dog walking and going out and you know things that are good for you and people with mental health difficulties, so social media has many positive things to offer people who have any mental health problems including people with BDD we actively encourage them to use the right sort of social media" ***Lines 98-104; P4***

For P4, the benefits of SNS are something that needs to be remembered, suggesting that the advantages of SNS are overlooked. He draws upon examples of connections that may be able to offer support to individuals with the disorder, in addition to content that may encourage beneficial interests such as "dog walking", to encourage activity away from appearance. Indeed, previous research has demonstrated that individuals with mental disorders use SNS as a way to connect with mental health providers (Birnbaum et al., 2017), and to access mental health services over SNS to help cope with mental disorder symptoms or for promoting health and well-being (Naslund et al., 2017; Naslund et al., 2020), which is reflected in P4's excerpt when he refers to the ability to connect with charities and organisations. As such, for P4, these types of features of SNS seem to be what he regards as the right sort of SNS for BDD, and the type to be "actively encouraged" within clinical settings. Similarly, P3 also draws upon the use of SNS for BDD individuals to seek help:

"I mean obviously social media is used to spread awareness so in that sense people know we use social media to raise awareness of BDD and I think that that has had a positive effect in that sense that people found out about BDD in that way and sought the help that they needed" ***Lines 243-246; P3***

SNS has been shown to provide a medium for the promotion of campaigns around the education and awareness of mental health (Latha et al., 2020), which P3 draws upon within her account. As a result of this, she reflects upon how this may provide information BDD individuals may need, encouraging them to seek "the help that they need". This gave the impression that for many, the symptoms of BDD may not be recognised (Veale et al., 2016), and that SNS provided them the resource to learn about the disorder. Not only this, but it has been demonstrated that SNS can provide a supportive environment in which individuals can explore topics around mental health without the need to explore personal details, presenting a less stigmatising and threating option for individuals to seek information around mental

health (Birnbaum et al., 2018), suggesting that SNS may play a role in helping individuals navigate their experiences with BDD.

For P5, SNS was perceived as beneficial for individuals who are on the "severe end of the spectrum" of BDD:

"Well the people with BDD that we know, who are on the more severe end of the spectrum don't have peers and friends (..) so (...) they're very isolated (...) so I think they might use the internet for relationships, friendships but it's more (..) on the basis of texting, using WhatsApp er umm (..) or you know they wouldn't necessarily use Skype as a means of having to reveal yourself" ***Lines 169-173; P5***

P5 reflects upon experiences with individuals with severe BDD that he has worked with, highlighting their isolation from others (Didie et al., 2006). From P5's perspective, SNS can provide these individuals the opportunity for connecting with others. Indeed, previous research has demonstrated SNS to foster connections and reducing loneliness through the ability to interact with others online (Teppers et al., 2014), which P5 seems to express when referring to isolated individuals using the internet for "relationships" and "friendships". However, it has also been shown that the ability to connect with others online may be paradoxical in that spending time on online connections can also reduce meaningful face-to-face connections, particularly if an individual is avoiding perceived threats (Ahn & Shin, 2013). This is reflected in P5's account when he expresses that individuals with more severe BDD may not use features that would "reveal" or show themselves, which is consistent with the perceived threat of being negatively judged and rejected by others in BDD (Baldock & Veale, 2019).

9.4.4.2 SNS as exposure therapy

For two participants, SNS was considered as being a potential benefit within treatment, particularly as a form of exposure therapy. For example, P2 drew upon her own experience using SNS as a form of exposure:

"I've certainly tried to harness social media in exposures in my treatments (..) um, like I had somebody practice for instance um posting a picture on Snapchat to his friends and was like, you're not doctoring it up, you're not taking a million, you're just going to take a selfie and post it and let it go, and practice sitting with that uncertainty and anxiety of how it's being perceived and Snapchat is an easier platform because the picture's out there and then it disappears versus you know not the video on Instagram but the photo on Instagram that sits there and accrues likes, that's maybe more triggering so um I think if you sort of talk about it as a ritual with your patients and use it as an opportunity to like practice addressing your BDD symptoms through exposure and response prevention, it could maybe be useful"

Lines 122-131; P2

Within P2's account, she implies that different SNS may require different approaches in exposure, by comparing both Snapchat and Instagram. In particular, she draws upon encouraging individuals to sit with the "uncertainty and anxiety" of how their image may be perceived. This is parallel to the goal of exposure therapy, which is to increase psychological flexibility; that is, broadening the individual's skills in the presence of feared events (in this case, posting an image of themselves) and increasing the readiness to engage in activities whilst experiencing difficult emotions, such as the "uncertainty and anxiety" referred to by P2 (Linde et al., 2015). For P2, Snapchat is perceived as being an "easier" platform in regard to experiencing difficult emotions due to the transient nature of sending and receiving photos, as opposed to Instagram's more permanent posts which can "accrue" likes which may be "triggering" as they may act as a form of appearance acceptance, as discussed in the

subtheme *The reinforcement of appearance reassurance*. However, P2 expresses that active discussion and engagement between clinician and BDD client to address SNS related-BDD symptoms can be "useful", creating the impression that both active dialogue and guided SNS use may be beneficial in BDD treatment. This draws upon current components of CBT in light of psychoeducation and cognitive behavioural case formulation, whereby both client and therapist work together to understand the client's difficulties and triggers, to plan effective treatment (Wilhelm et al., 2015), and indicates that addressing SNS in this manner can be a potential avenue for developing successful BDD treatment that is personalised to the client.

For P1, Instagram was perceived as a platform that may be advantageous as a form of exposure:

"My hunch is that if someone is highly avoidant of either seeing their picture, then using Instagram could be helpful as a form of exposure (…) however, what I would say about that and this is ongoing, my colleague tried this out about two weeks ago, however I think that it's possibly a little bit like the way BDD sufferers use mirrors (…) so you either get excessive mirror checking or total avoidance (..) now in mirror checking there's a therapy procedure called mirror retraining (..) so what we do with mirror retraining is that we help someone um look at their image but see the whole picture" ***Lines 149-156; P1***

In this passage, P1 draws upon similarities between SNS and mirrors as a way to make sense of how BDD individuals may use SNS platforms. In particular, he expresses two extremes of usage within mirrors: "excessive" and "total avoidance", which is consistent with previous literature highlighting BDD individuals may avoid cues that trigger appearance-related anxiety, or repeatedly check their perceived flaw as a form or reassurance (Veale & Gilbert, 2014). As a result, P1 refers to mirror retraining as a way to encourage clients to view their appearance in a more holistic manner. Mirror retraining can help individuals learn to refrain

from engaging in safety or ritualistic behaviours by broadening their perspectives of appearance, rather than focussing on their perceived flaws (Wilhelm et al., 2014), and has been shown to have good response rates in BDD, with BDD symptom reductions up to 78% (Beilharz et al., 2017). Thus, from P1's perspective, a form of mirror retraining seems to be a potential way to address SNS use within BDD individuals, stating:

"We need to develop a similar protocol for BDD sufferers and social media, i.e., how to use social media in a normal way (...) and which doesn't reinforce the uh, the symptoms. So my hunch is that um, my colleague having recommended my client to use Instagram as a form of exposure, we'll probably need to watch this quite carefully to see how she continues to use it (..) so what I reckon what we're probably going to be looking at is she using Instagram in a normal way" ***Lines 165-171; P1***

Within this account, P1 expresses a need for health professionals to develop a "protocol" similar to that of mirror retraining, but in the context of SNS use in BDD. However, in this excerpt, the participant recommends caution, wherein he draws upon the possibility of SNS exposure as reinforcing symptoms, creating the impression that there is an element of risk in exacerbating symptoms through introducing SNS in treatment. In reflecting upon his experience with a client, P1 highlights the importance of guided use and observation to ensure that exposure to SNS does not worsen symptoms, and to ensure that SNS is used in a "normal way". Whilst it is not specified what this "normal" way of usage is, previous research in the context of mirror gazing and mirror retraining has found that for some BDD individuals, mirror exposure can lead to significant distress and the exacerbation of negative emotional states due to reminding the individual of their perceived flaws (Windheim et al., 2011; Veale et al., 2016; Griffen et al., 2018). Thus, it may be that a "normal" way of SNS use avoids content or features of SNS that may serve as a reminder for the self-perceived appearance flaws in BDD individuals. It is suggested that a form of SNS exposure may have

the potential to be beneficial for BDD individuals; however, if utilised, should be implemented under careful observation and guidance of the clinician to avoid exacerbating symptoms.

Within this theme, participants considered the advantages of SNS use within BDD, drawing upon the ability to seek support and connections online (Teppers et al., 2014), in addition to seeking information about the disorder (Birnbaum et al., 2018). More specifically, it was highlighted that SNS can be beneficial for spreading awareness of the disorder, which may encourage individuals to seek the help they need. On the other hand, the ability to connect with others online, may reduce making connections within face-to-face contexts, suggesting individuals with BDD should be encouraged not to use online connections as a replacement for face-to-face interactions. Nevertheless, participants also expressed the potential of including SNS within treatment as a form of exposure therapy, as a way to increase the individuals' willingness to engage in activities whilst experiencing difficult emotions, and by broadening individuals' perspectives around appearance (Linde et al., 2015; Wilhelm et al., 2014).

9.4.5 A clinician's need for understanding

Within interviews, participants drew upon the need to further understand the role of SNS within clinical practice. In particular, they discussed the role of SNS as being a maintenance rather than causative factor in BDD. Moreover, participants highlighted the need for understanding SNS further to be beneficial within treatment settings. These perceptions are further explored in the subthemes *"It's not the whole picture": Elucidating the role of SNS use in BDD* and *The "dangerous game" of SNS use: Recognising the motivations of BDD individuals in treatment.*

9.4.5.1 "It's not the whole picture": Elucidating the role of SNS use in BDD

When discussing the role of SNS in BDD, participants highlighted that SNS use was likely a maintaining factor within BDD rather than a causative factor. Indeed, it has been posited that there may be a number of risk factors involved in the development of BDD, including developmental, social and neurocognitive factors (Feusner et al., 2010). In particular, the role of bullying about appearance was drawn upon by two participants, and was considered as exacerbated on SNS. For example, P3 stated:

"I mean for somebody who has maybe sort of a predisposition to BDD (..) would probably be you know like social media can add a lot of pressure to kind of look a specific way to feel self-conscious so I think it can explain part of that development but not certainly the whole picture (..) and also social media is also a site where there's bullying [unintelligible] and it might be appearance related bullying and that's known to be a part in the development in BDD so yeah I'm sure there is a link in the development in BDD that can be explained in some cases with social media" ***Lines 277-284; P3***

In P3's account, she draws upon individuals potentially having a "predisposition" to BDD. Indeed, it has been shown that BDD is a complex disorder, which has been demonstrated to include a number of biological susceptibilities, such as selective cognitive dysfunction (Blum et al., 2018) and abnormal visual processing (Feusner et al., 2010) that may lead to the development of BDD (Li et al., 2013), and which may be what P3 refers to in her perception that SNS is "not the whole picture" in the development in BDD. More specifically, she draws upon the role of bullying on SNS as potentially having a role within the development of BDD. Previous research has shown that appearance-related bullying is the most reported experience related to BDD symptom severity (Weingarden et al., 2017), which can encourage individuals to develop a heightened perception of body image (Veale et al., 1996). In a

similar vein, P2 also draws upon the role of appearance-related bullying within an SNS context:

"We really need better research on the development of BDD but there's at least a little bit of initial evidence that bullying and appearance-based bullying may play a role in the development of BDD and also that cultural messages about beauty and beauty standards can also play a role in the development of BDD and I think social media again sort of creates um (..) an environment where those things happen (..) so I think especially among I think adolescents and early adolescents who are exposed to more cyberbullying on social media, that that could increase their risk." ***Lines 155-161; P2***

It has been shown that appearance is the most reported reason for being cyberbullied (Mishna et al., 2010; Berne et al., 2014), whilst SNS can contribute toward supporting societal standards of appearance due to the interactivity between peer, family and celebrities and influencers (Santarossa & Woodruff, 2017). For P2, this may explain creating the "environment" that emphasises standards of beauty and appearance-based bullying. In comprehending the factors that may contribute towards the development of BDD, she describes this as increasing the "risk" of BDD. From the perspective of classical and operant conditioning, appearance-based bullying may cause a negative emotional response such as shame or anxiety, leading to negative appearance-based beliefs (Baldock & Veale, 2019). As a consequence of this, individuals may begin to engage in maladaptive behaviours (e.g., excessive checking) that are present in BDD, and serve to reinforce maladaptive appearance cognitions (Feusner et al., 2010), which may reflect the "risk" P2 is referring to. This creates the impression that appearance-based bullying on SNS may play a contributing role in the development of BDD.

P1 comprehends the role of SNS by comparing BDD and non-BDD populations:

"I read not so long ago is that social media doesn't tend to precipitate these types of problems but if you have these problems already it tends to exacerbate it (..) so I think that could be an interesting question to explore further (..) I mean my personal hunch is yeah, it probably does, because I was saying how it seems to me after thirteen years of working with BDD, these days um (..) the non-BDD population out there and the BDD sufferers, the gap between them has become so narrow that I think that (..) okay let's put it this way, I think that erm (..) use of social media is much more likely to trigger a predisposition towards developing BDD" ***Lines 267-275; P1***

P1 conveys mixed views on the role of SNS. He draws upon reading literature around SNS as "exacerbate[ing]" conditions such as BDD, which seems to be what he grounds his perception of SNS on. However, in making sense of his perception, he goes on to draw upon his own experience of working with BDD, expressing that the gap between the non-BDD population and BDD individuals has become "narrow". Whilst it is not specified what this gap is, it suggests that there is subthreshold BDD, whereby symptoms presented do not meet the diagnostic criteria, however, involve the presence of core symptoms which can predict the clinical manifestation of the disorder (Wolitzky-Taylor et al., 2014). This can make individuals more vulnerable to the development of clinical BDD, which may be what P1 refers to when stating SNS may "trigger the predisposition" of BDD. P1's account creates the impression that SNS use contributes to maintaining BDD and the potential development of the disorder if an individual is vulnerable to its development.

9.4.5.2 The "dangerous game" of SNS use: Recognising the motivations of BDD individuals in treatment

When considering addressing SNS in BDD treatment, participants drew upon the importance of understanding the purposes of SNS use for BDD individuals. For instance, P5 reveals:

"As a commission we normally want to know like in most things we want to know what you're doing less of, compared to what you used to do before the problem and what you're doing more of compared to what you used to do and how does that function (…) you know like most things some people now will be avoiding social media (.) I think that's probably less common and some people it's not an issue and for others they'll be using social media more frequently (…) and we want to know what the function behind that is" ***Lines 229-235; P5***

P5 draws upon his previous experience in protocol followed during treatment, to make sense of how understanding can be gained regarding SNS use in BDD. In particular, he draws upon the personal element of treatment to understand certain functionalities that may motivate individuals to use SNS either less or more frequently. Indeed, it has been shown that understanding a patient's motivations for engaging in safety behaviours is of great value within therapy, and can be used to construct suitable sessions to test out the client's beliefs (Veale, 2001). As such, this indicates that the recognition of the functions behind SNS use in BDD can contribute towards addressing specific beliefs associated with SNS use within treatment.

For P3, encouraging the BDD client of their behaviours is perceived as important to her in treatment:

"I think the first step is kind of recognising that it's [comparisons] happening cause a lot of people will be doing it for so long that they don't notice when they're doing it and when they're spending the last hour looking online and looking at how this person looks and comparing it to themselves (..) so noticing what why is it a dangerous game, so noticing the effects it has on their obsessions about how they look, their feelings that they have about themselves so that they recognise that, okay, this is not perhaps the most helpful thing to do when I'm already not feeling when I'm already feeling insecure about myself perhaps going

on Instagram and checking all these images and spending time looking at these models is not going to be helpful" ***Lines 186-194;P3***

In P3's account, she uses engaging in comparisons as an example of why BDD individuals may use SNS. In doing so, she describes how for many individuals, comparisons are a subconscious behaviour, which they do not "notice" they are engaging in, likening it to a "dangerous game" regarding their BDD symptoms. This metaphorical choice emphasises the risk of engaging in comparisons, which to P3, is exacerbated and not "helpful" in the context of SNS. She refers to bringing awareness to the client about their behaviours as being the "first step" in recognising their actions. This is consistent with cognitive strategies within CBT which focus on the identification of maladaptive beliefs in the individual to subsequently help them develop more realistic beliefs and encourage them to avoid engaging in ritualistic behaviours (Ayub et al., 2018). Thus, for P3, encouraging clients to be aware of their own motivations of using SNS is an important aspect within treatment.

For P1, the need for balance in the use of SNS in treatment is important:

"I think we need to develop what would normal Instagram use look like versus what would BDD Instagram use look like (..) and my hunch is that if we are not careful about that (..) then what she's started to then then it could begin to exacerbate the BDD if we're not careful (..) I think it's finding that balance" ***Lines 172-176; P1***

P1 describes a need for developing a more objective gauge in regard to "normal" vs. BDD Instagram usage for understanding SNS in BDD treatment. In doing so, he conveys an element of responsibility of health professionals to develop this in stating "we need to". In particular, this need for a baseline of 'normal' SNS use is emphasised as P1 perceives a risk of exacerbating symptoms by addressing and using SNS within treatment, creating the

impression that a gauge of what is "normal" usage can help in monitoring and exercising precaution within treatment. Moreover, P1 states:

"I think it would be really good um and specifically to ask how they use it, I think that's the golden question (..) is not so much do they use it, which I suppose can be presumed, or maybe not but I think how they use it, what function their use of it serves, for example they put up images are they hoping for likes? Because that might serve reassurance seeking which might reinforce the problem um (..) do they do excessive comparing? If so, that's likely to enforce, reinforce the problem (..) erm when they put up images on the screen, when they post images, how long do they spend beforehand trying to obtain the right image (..) so how they use it I think would be essential" ***Lines 248-256; P1***

Within CBT, it is important for health professionals to explore factors in the BDD client's life that may contribute to maintaining or "reinforc[ing]" their symptoms (Ayub et al., 2018), which is reflected in P1's account, whereby he questions potential ways in which SNS use may reinforce BDD symptoms. In particular, he describes understanding the "function" of their use as being "essential" in understanding the role of SNS in BDD. Indeed, understanding specific motivations can be beneficial in CBT, as optional treatment modules can be tailored to address behaviours that may affect some individuals but not others (Wilhelm et al., 2010). Thus, P1's account creates the impression that understanding the specific functions of SNS is important to benefit both the client and health professional in tailoring and monitoring SNS use regarding BDD symptoms.

Within this theme, SNS use was considered by participants as maintenance factor in the development of BDD, rather than a causative factor. However, it was perceived that if an individual had a predisposition to BDD, negative interactions with others in the context of appearance-based cyberbullying may play a role in triggering the development of BDD

symptoms. Participants also expressed a need for actively discussing SNS use with the client as a way to make them aware of the ways they are engaging with SNS and why, but also to enable clinicians to tailor CBT modules within treatment.

9.5 Implications

The present findings provide a number of implications within clinical practice. In particular, findings highlight the need for clinicians to explore BDD clients' motivations behind their SNS use in the context of their symptoms, to address and target the specific behaviours that may contribute to maintaining their symptoms. Moreover, findings also highlight the potential of SNS to be used in treatment as a form of exposure therapy. Further research should be conducted around the viability of using SNS in BDD treatment, as suggested within the present findings. If successful, suitable protocols could be developed to guide practitioners to utilise SNS in treatment effectively, in a way that lowers the risk of exacerbating SNS use and BDD symptoms in clients. Nevertheless, practitioners can work towards guiding BDD individuals to engage with SNS more consciously, and encouraging them to take a broader perspective of content that is appearance-focussed online.

9.6 Limitations

IPA was used within this study as clinicians were situated within the lived world of individuals living with BDD (Larkin et al., 2019). Whilst this allowed to shed light on their perspective of SNS use within BDD individuals, these perspectives may not be viewed as representative of the unique and personal experiences BDD individuals have when engaging with SNS. The use of a multi-perspectival IPA design, which explores experiences from more than one perspective (Larkin et al., 2019), may enable exploring the co-constitutive meaning-making process between clinician and BDD client, enabling a fuller understanding of SNS use in BDD (Loaring et al., 2015; Borg Xuereb et al., 2015). Nevertheless, the aim of this

study was to explore how clinicians made sense of SNS use in BDD, and illuminated clinicians' experiences of SNS within the field of BDD. In doing so, practice-based insights were explored in the context of SNS and BDD, providing knowledge about an underexplored topic. Moreover, insights into possible developments for therapeutic treatment were highlighted, which may have not been possible without the first-hand experiences of health-professionals in BDD.

In addition, it has been posited that cultural factors may play in the expression of BDD symptoms and variations of beauty standards (Feusner et al., 2010). The present study included a westernised participant sample, which may limit the generalisability of findings to other health professionals within other cultural backgrounds. For example, it has been shown that Asian individuals feel more pressure from the media, peers and family to conform to standard beauty norms, and are more likely to have a distorted perception of appearance in comparison to western cultures due to the internalisation of appearance ideals (Jung & Forbes, 2007; Stojcic et al., 2020). Thus, research should explore the extent to which SNS may influence symptoms of BDD within these cultures.

9.7 Conclusion

Findings of the present study have highlighted that individuals with BDD may use SNS to seek reassurance from cosmetic consultants online, or through the reception of likes on photos posted of themselves, which may contribute to maintaining BDD symptoms. However, SNS was also perceived to provide benefits in regard to finding information about the disorder, and connecting with others for individuals who may be on the more severe side of the BDD spectrum. In light of this, the need for addressing SNS in treatment was emphasised to gain understanding of the functions of SNS use and grasp the ways in which treatment could be tailored to address SNS use in BDD. Not only this, but it was also

indicated that SNS use may play a future role as a form of exposure therapy, providing insight into the development of treatment and support for individuals with BDD.

PART V: GENERAL DISCUSSION

Chapter 10

This doctoral research project aimed to investigate the role of SNS (with a focus on the platform Instagram) usage patterns on psychological well-being outcomes, and to identify and understand the features of SNS (and Instagram) use that may influence well-being outcomes from the perspectives of Instagram users, individuals experiencing BDD and clinicians working in the field of BDD. The unique contribution to knowledge was the assessment of the role of Instagram and its specific features in contributing towards appearance dissatisfaction in both clinical and non-clinical populations, in addition to the assessment of Instagram engagement and the role of appearance anxiety in the influence of psychology well-being. Moreover, the present project also presented a unique contribution to knowledge in research methods through the development and utilisation of a unique smartphone application 'DiaryMood' to objectively capture Instagram usage and well-being. Previous literature has highlighted negative associations between Instagram and SNS use, body image and well-being, identifying some of the motivations behind SNS use and the features of SNS that may contribute towards negative well-being outcomes. In the present research, the role of Instagram and SNS on body image and well-being outcomes was assessed in both non-clinical and clinical populations.

The first systematic review presented in Chapter 2 aimed to i) review research that has investigated the influence of SNS use on body image dissatisfaction and ii) review studies investigating features of SNS (passive and/or active) and the relationship with body image. Specifically, this review investigated i) SNS usage frequency and patterns, (ii) the features of SNS that may contribute to the development of body image dissatisfaction, and (iii) the mediating factors that may facilitate and maintain body image concerns, to provide further

understanding of the factors of SNS that may result in differential outcomes for well-being, body image concerns and BDD symptomatology. A systematic search using Web of Science, PsycINFO and PubMed databases resulted in 40 studies meeting the specific inclusion criteria. It was found that passive and appearance-focussed SNS use were particularly influential to body image dissatisfaction. Parallels were also highlighted regarding body image dissatisfaction and BDD, indicating SNS usage as being a potential risk factor of BDD symptoms. As such, this review contributed to the identification of features of SNS that may influence BDD symptoms, in addition to highlighting the need for BDD research in the context of SNS.

The second systematic review presented in Chapter 3 aimed to (i) identify objective measures that assess problematic smartphone usage, and (ii) summarise the characteristics, strengths and limitations of objective measures for assessing problematic smartphone use. A systematic search using Web of Science, Scopus, PsychInfo and PubMed databases resulted in 18 studies meeting specific inclusion criteria. It was found that passive objective monitoring can enable smartphone use patterns to be inferred within a short timeframe, and provide ecologically valid data on smartphone behaviour. This review contributed to the recommendations of SNS features that can be observed with passive objective monitoring in SNS research, and aided in informing the development of the application DiaryMood that was utilised within the present project.

The first empirical study presented in Chapter 5 aimed to investigate the relationship between Instagram usage and age, in addition to exploring the role of SNS use, in particular Instagram, on body image and well-being in a non-clinical population. Objective screen time usage was observed across a period of seven days, and focus groups were also conducted to explore attitudes and experiences around Instagram and well-being. The use of focus groups allowed for greater understanding to be developed around the ways Instagram users construct

and create meanings around the content viewed online. Moreover, discussions shed light on the ways interactions with others on Instagram can contribute towards the construction of body ideas and attitudes around other users' behaviours online. Objective findings revealed that female users spend longer on Instagram across a seven-day period, whilst Instagram usage decreases when age increases. Focus group findings revealed three main themes. The first, *Staying cautious on SNS* revealed user caution as being derived through interpersonal interactions and media stories expressing the need for caution on SNS, and highlighted the users' responsibility in mitigating negative well-being impacts associated with SNS use. The second theme, *Comparisons to others: The highlight reel of Instagram* framed influencers as setting appearance expectations that were accepted by users of Instagram. In particular, distinguishing what is real and not real, and envy and motivation towards idealised content were framed to be behaviours created by users in response to wider social expectations on Instagram. The third theme *'Fake it till you make it': Seeking validation and social acceptance* revealed Instagram as being the main platform for identity construction and impression management, and for encouraging users to portray their best selves through image enhancements (e.g., filters and editing tools). Likes and comments especially were referred to as providing validation and feedback for one's identity online. The emphasis placed on likes and comments in amplifying appearance ideals was found to be consistent with previous literature (e.g., Dumas et al., 2017; Frison & Eggermont, 2017), developing upon the previous knowledge base. However, this study was unique in that it highlighted SNS as combining aspects of both offline and online peer and media influences, whereby appearance expectations are developed through offline conversation before being further endorsed through influential figures and interactive features on Instagram.

The second empirical study presented in Chapter 6 aimed to i) investigate the relationship between active, passive and problematic Instagram use on the well-being outcomes of

anxiety, depression and appearance anxiety and ii) examine the mediating role of appearance anxiety in the relationship between Instagram usage and the selected well-being variables. A cross-sectional online survey was used with data from 290 participants. Results found that problematic Instagram use was associated with symptoms of anxiety and depression, whilst active Instagram usage was negatively associated with depression. Moreover, appearance anxiety was revealed as a significant mediator for passive use on anxiety and depression, as well as for problematic use on anxiety and depression. Taken together, the findings from the first two empirical studies suggest that when using Instagram passively or problematically, users are more likely to be exposed to and observe content portraying other users' best selves. Likes and comments that are observed in connection to appearance-based images are then likely to add meaning and valence to these types of photos (Rodgers, 2016; Kim, 2020), reinforcing the offline representation of beauty and directing users' perception of appearance ideals. As a result, this can increase the number of negative comparisons users engage with online, leading to higher levels of depression and anxiety due to rumination and self-evaluation of appearance (Fink et al., 2013; Antonietti et al., 2020). In contrast to previous literature, in Chapter 6 it was found that appearance anxiety was not a mediator between problematic or passive use and self-esteem, suggesting that factors outside of Instagram may play a role in appearance anxiety, for example, offline societal appearance expectations, as reflected in Chapter 5. However, this may also be suggestive of coping strategies playing a protective role in well-being outcomes, echoing the user caution expressed in Chapter 5, and indicating user responsibility in mitigating negative well-being impacts associated with Instagram use.

The third empirical study in Chapter 7 was conducted to trial the use of a bespoke application to collect smartphone-based EMA with passive objective monitoring. This study aimed to investigate the association between Instagram usage and well-being, specifically observing

Instagram screen time, number of notifications received from Instagram and number of Instagram app launches on the well-being outcomes of mood, self-esteem and craving. Whilst findings were not significant, results showed evidence of usage patterns and well-being outcomes as fluctuating in parallel with one another across the period of data collection. Thus, the use of EMA and objective monitoring combined highlights the capability of employing objective smartphone within research design and methodology, and highlights its potential for future research in the context of SNS and well-being. The objective monitoring in this study allowed for a more nuanced understanding of user interaction on Instagram to be observed, and can contribute towards shedding light onto functions of passive and/or active usage that may influence well-being. Accordingly, the results presented in Chapter 7 developed upon the findings of Chapter 6 by evaluating specific functions of Instagram (i.e., time on platform, launches and notifications) that went beyond the proxy measures of passive and active usage as assessed by the PAUM (Gerson et al., 2017), and indicated objective monitoring and EMA as a beneficial method to observe variation in behaviour and psychological states of SNS users.

The final two studies presented in this thesis explored the role of SNS within a clinical population of individuals who live with BDD, in addition to exploring the role of SNS in BDD from a clinician's perspective. Chapter 8 aimed to explore how individuals experience using SNS and Instagram whilst living with BDD. A total of eight participants were interviewed regarding their individual experience of using SNS while living with and experiencing the symptoms of BDD. Participants' accounts were analysed using IPA. Three superordinate themes were developed: (i) *Agency online,* (ii) *Comprehending appearance comparisons as an individual with BDD* and (iii) *The value of others' perceptions online.* The first superordinate theme revealed that the value placed on appearance by BDD individuals led to a loss of control in viewing images of others. Subsequently, this led participants to try

and regain a sense of control of their Instagram use to mitigate feelings of low self-worth and distress in appearance. The second superordinate theme encompassed BDD participants' experiences of appearance comparisons online. It was found that comparisons with others were predominantly attributed to the desire to be and feel 'normal'. However, for some participants, comparisons to others played a protective role to avoid the threat of being negatively evaluated by others. The third theme revealed that BDD individuals experience an anxiety of judgement online due to fear of being evaluated negatively for their appearance. However, benefits were also ascribed to SNS use, including positive feelings around feeling accepted when positive comments and likes were received on a photo, in addition to feelings of belonging when finding support online.

Findings from Chapter 8 converged with several findings from Chapter 5. Firstly, likes and comments were expressed as a form of validation and acceptance in both the clinical and non-clinical populations, whereby approval from others online are considered an evaluation of status and self-worth. Judgements on appearance by others online were also considered as omnipresent within the Instagram environment, leading to feelings of anxiety, which were especially present within the clinical population. Moreover, similarities were drawn upon regarding appearance comparisons online. Both the clinical and non-clinical populations expressed comparisons as being driven by the desire of wanting attractive appearance and/or lifestyles presented by others online. Given this, there appeared to be corroboration around the motivations of using SNS between both clinical and non-clinical populations, although differences were also apparent in the clinical population as a result of BDD-related behaviours and cognitions. BDD-related behaviours that were transferred onto the SNS environment aligned with concepts around rejection sensitivity (Webb et al., 2015), self-discrepancy (Higgins, 1987) and social conditioning and learning (Veale, 2004; Baldock & Veale, 2019), and it was suggested that Instagram provided an environment, which through

user interactions and appearance content, amalgamated to form an accessible appearance-focussed platform that may perpetuate BDD symptoms.

The final study in Chapter 9 aimed to explore how health professionals in the field of BDD make sense of SNS use in BDD. A total of five clinicians were interviewed regarding their experience of SNS usage in treating individuals with BDD. Interviews were analysed using IPA. Five superordinate themes were derived from the data: (i) *The vulnerability for self-appraisal online,* (ii) *Making sense of constant comparisons,* (iii) *Going beyond the importance of appearance,* (iv) *SNS as a therapeutic tool in BDD treatment* and (v) *A clinician's need for understanding.* In the first theme, seeking reassurance online through the use of cosmetic profiles, likes and comments was highlighted as being a form of validation for appearance concerns, in addition to reinforcing a need for appearance acceptance. In the second theme, comparisons were highlighted as a way for BDD individuals to socially rank themselves against others. In particular, this was perceived as pursuing a feeling of normality in oneself, although from the clinician's experience, also served as increasing appearance preoccupation. The third theme highlighted SNS as reinforcing appearance values through idealised images, whereby the need to mitigate the importance of appearance in BDD people was emphasised by participants. However, the fourth theme revealed SNS as also being beneficial for BDD individuals to seek support and connections online. Additionally, SNS use was perceived as having the potential to be used as a form of exposure therapy with treatment. In the fifth theme, SNS use was emphasised as being a maintenance factor in BDD rather than a causative factor. In this theme, the importance of discussing SNS use with BDD clients was highlighted to ensure CBT modules are tailored for individual clients within treatment. Results from this chapter were also found to converge with Chapters 5 and 8, whereby likes and comments received on online posts were perceived as being a form of validation and feedback on appearance, whilst understandings of the function of appearance

comparisons also reflected BDD participant experiences of the motivations behind their appearance comparisons to others. However, a new perspective into SNS use emerged in that it was also perceived as a potential avenue for exposure treatment in BDD.

Taken together, the findings of the empirical studies provide novel insights into the role of Instagram, well-being, body image and BDD. The interplay between both offline and online peer and media influences were found to endorse appearance expectations within the Instagram environment, reinforcing users' perceptions of appearance ideals offline. The ability to digitally manipulate photographs can allow users to create an image of themselves that is closest to society's portrayal of the ideal appearance (Chua & Chang, 2016), making it more difficult for viewers to distinguish between the real and manipulated presentation of appearance. This can subsequently lead to envy and the exacerbation of self-evaluation and the experience of appearance anxiety, negative mood and low self-worth due to the belief societal appearance expectations are not met. For vulnerable individuals, such as those with or experiencing symptoms of BDD, SNS can play a role in exacerbating and maintaining maladaptive appearance cognitions and compulsions associated with checking and seeking reassurance of appearance. However, it is not to say that Instagram use is wholly associated with negative outcomes. Findings of the present project also highlighted the benefits Instagram use can provide, regarding seeking support and information online, and enabling users who may struggle with psychological well-being to find others to share experiences with. This is consistent with previous literature showing mutual reciprocity with others online as contributing towards minimising feelings of loneliness (Naslund et al., 2014). Moreover, it has been shown that seeking information from others about psychological well-being can help reduce fears and boost confidence about personal experiences through understanding contextual causes and consequences of well-being outcomes (Ziebland & Wyke, 2012). Thus, online communities may play a role in supporting and helping individuals navigate their well-

being and body image experiences. In addition, from a health professionals' perspective, whilst SNS use was deemed as encouraging behaviours that maintain BDD, it was also considered a potential avenue for inclusion within therapeutic treatment to encourage BDD individuals to manage the distress around appearance they may experience whilst online. Overall, Instagram use was found to provide benefits regarding support and connections with others. However, it was also revealed to be a platform that holds concern for well-being outcomes, particularly in the context of appearance-based perceptions and beliefs.

10.1 Unique contributions to knowledge

The present project provided a unique contribution to knowledge in several areas, which are detailed below:

SNS use in non-clinical populations

Socially constructed attitudes around SNS, well-being and body image highlighted the interplay between both offline and online peer and media influences to endorse appearance expectations within the Instagram environment, reinforcing users' perceptions of appearance ideals offline. In addition, the paradoxes of individual choice regarding content viewed versus algorithms of SNS (such as the Instagram explore page) were identified as influencing well-being and body image experiences of users. This contributes to knowledge pertaining to user experiences on Instagram, specifically regarding the interactive features of likes and comments online, and the valence these features possess in endorsing societal expectations of appearance in an Instagram environment.

Moreover, appearance anxiety within a non-clinical population was associated with negative well-being outcomes, particularly in light of passive and problematic Instagram usage. By identifying the underlying mechanisms between SNS usage and well-being, such as appearance anxiety, this contributes to knowledge around SNS engagement that may

facilitate maladaptive appearance cognitions, and can contribute to the understanding of sub-threshold expressions of clinical body image disorders, such as BDD.

A modern understanding of BDD

Exploring Instagram use from the experiences of individuals with BDD identified likes and comments as contributing to BDD symptoms. Appearance comparisons were also revealed as heightening the awareness of perceived appearance flaws, encouraging rumination of appearance concerns in those with BDD. However, comparisons on Instagram were also perceived to play a protective role in mitigating negative cognitions about the self and appearance. Moreover, Instagram was found to be an environment for connecting with others and sharing experiences of BDD with others online, providing a space for support and information. These findings contribute towards a modern understanding of SNS use within BDD by identifying the features of SNS that can go towards maintaining and exacerbating BDD symptoms, but also features that may provide benefits in gaining support and understanding of the disorder for those with BDD.

Furthermore, exploring Instagram use in BDD from a clinician's perspective highlighted that whilst SNS may contribute towards the maintenance of BDD symptoms, SNS may also play a beneficial role within therapeutic treatment, particularly as a tool within exposure therapy. This finding provided a new perspective into BDD interventions by emphasising the potential use of SNS within exposure treatment in BDD.

A new perspective in assessing SNS and psychological behaviour

The present project identified specific functions of SNS (e.g., number of app launches) which can be useful in assessing SNS behaviours objectively, contributing to knowledge in research methodology and methods. In addition, the development and utilisation of the application DiaryMood within the present research, highlighted the viability of employing digital

technology to assess SNS and well-being patterns. Given this, the DiaryMood application can be used and developed for future research in the realm of SNS user behaviour, contributing to behavioural assessment from a digital technology perspective.

10.2 A reflection on methodologies used

This project utilised a multistage mixed methods approach, integrating quantitative, objective and qualitative methods. Self-report methods were utilised in Chapter 6. One of the main advantages of self-report methods is that they are cost-effective and can enable collection of a large amount of data (Demetriou et al., 2015). However, one disadvantage of self-report methods is that they are prone to social desirability bias, particularly when regarding sensitive questions (Demetriou et al., 2015). As the aims of Chapter 6 were to investigate passive and active Instagram usage, in addition to outcomes regarding anxiety, depression, self-esteem and appearance anxiety, it is possible that participants responded to well-being questions in a socially desirable direction. Nevertheless, it has also been shown that the anonymity of self-reports can decrease the respondents' desire to distort responses in a socially desirable manner (Lelkes et al., 2012). In addition, there is evidence to support the use of self-report in quantifying psychological well-being symptoms with good sensitivity and specificity (Fischer et al., 2015). This has been shown to be beneficial when assessing mental health symptoms (Fear et al., 2012) indicating self-report as being a valuable tool in examining psychological well-being outcomes within the present project.

In addition to self-report, this project employed the use of smartphone-based EMA with passive objective monitoring via the application DiaryMood. The EMA utilised in DiaryMood predominantly relied on respondent input for the well-being scales, and as a result, does not eliminate biases associated with traditional self-report methods, such as social desirability. It has also been indicated that the response burden of EMA smartphone-based assessments can lead to the decrease of user motivation and compliance rates when applied

for too long (Schwartz et al., 2002; Boonstra et al., 2018). Nevertheless, it has been indicated that user control is highly valued by respondents, and when triggered functions are adopted to deliver reminders to the participant, this can help in maintaining compliance rates (Chang et al., 2017). The present project adopted the use of daily reminders to prompt participants to input their well-being responses, which appeared to be successful in reducing dropout rates throughout the period of data collection. In addition, smartphone-based EMA in the present study allowed for information of users' well-being experiences to be collected as they naturally occur, minimising retrospective biases that are often associated with self-report methods (Trull & Edner-Priemer, 2014). Thus, this method was beneficial in endeavouring to overcome the disadvantage of retrospective self-report, and allowed for a more accurate and ecologically valid depiction of well-being in the context of Instagram engagement.

In a similar vein, the passive monitoring of SNS use can be subject to issues with compliance rates, particularly if there is a noticeable impact on battery life during data collection, or if there is participant scepticism around data privacy (Tossell et al., 2012; Boonstra et al., 2018). To limit battery drainage in the present project, DiaryMood did not utilise sampling sensors to collect Instagram use data. Instead, objective data were inputted into DiaryMood manually by participants from monitoring features already inbuilt within Android smartphones. Furthermore, participants were informed about what data would be collected, how their data would be used and protected, in addition to the anonymisation process prior to the commencement of the research. Notwithstanding, the use of smartphone-based EMA and passive objective monitoring allowed specific variables of interest to be investigated, and illuminated how checking patterns and notifications can be used as a predictive measure of well-being and behaviour across a one-week period. Thus, monitoring Instagram interaction through the use of smartphone-based EMA and passive objective monitoring was a viable

form of data collection within the present project, and highlights its feasibility for future research in the context of SNS and well-being.

In addition to self-report and objective monitoring, qualitative methods were utilised in the present research in the form of focus groups and interviews. Qualitative research has several advantages over quantitative approaches, including the ability to produce detailed descriptions of participants' attitudes, feelings, and experiences (Rahman, 2017). Focus groups draw upon the group dynamics during participant discussion to explore the phenomena of interest. That is, the dynamics of the group can encourage disclosure of participants, leading to discussion and debate, providing the opportunity to explore issues that may not be well understood (Jordan et al., 2007; Nyumba et al., 2018). On the other hand, interviews are advantageous to gather in-depth understandings when exploring sensitive topics where individuals may not be comfortable discussing within a group environment (Gill et al., 2008). Given these advantages, focus groups were employed in the non-clinical strand of the project to generate information on collective views on well-being and the use of Instagram, whilst semi-structured interviews were conducted for the clinical strand of the project as BDD is a sensitive and personal experience. As a result, the knowledge gained from these methods contributed to uncovering not only societal attitudes around Instagram and appearance ideals and expectations, but also into how and why both clinical and non-clinical individuals engage with SNS platforms, and the meanings behind these experiences.

To expand on knowledge and generate new insights, a dialectical epistemological position was employed for the present project, utilising multistage mixed methods. The multistage mixed method accounted for multiple stages of data collection to be conducted, with the inclusion of qualitative and quantitative methods. With this, integration occurred through narrative, whereby the researcher reported the findings of each study separately, before they were merged within the present discussion chapter. In this way, the various philosophical

stances were recognised as different, enabling the creation of a dialogue that engaged different concepts and methods, in line with the dialectical stance (Johnson, 2011).

However, the mixed methods approach can be a challenging endeavour due to utilising a combination of both qualitative and quantitative methods. As discussed in Chapter 4, qualitative and quantitative methods draw upon different philosophical positions, which may arguably be perceived to be incongruent to one another. Yet, mixed methods research can be described as an interactive continuum between qualitative and quantitative methods in light of the research purpose (Newman & Benz, 1998; Gelo et al., 2008). That is, quantitative purposes of research generally surround the prediction of outcomes, measuring changes, testing new ideas and adding to knowledge, whereas qualitative research purposes generally encompass understanding complex phenomena, the generation of new ideas and informing personal, social and/or organisational bodies (Newman et al., 2003; Gelo et al., 2008). As such, mixed methods research can oscillate in a dynamic way between explanation and understanding, deduction and induction, and generalisation and contextualisation to provide a holistic and gestalt understanding regarding the use of SNS interaction and well-being outcomes (Gelo et al., 2008). The use of a mixed methods approach was therefore consistent with the purpose of the present project and allowed for insights into the complexities of Instagram use to be explored; not only adding to understanding of SNS, and expanding knowledge of user behaviour through DiaryMood, but also by producing new knowledge regarding the patient and expert populations of BDD.

10.3 Limitations and future directions

The present project highlighted a number of shortcomings and avenues for future research. Firstly, the Passive and Active Use Measure (Gerson et al., 2017) is the only scale to the researcher's knowledge that assesses users' passive and active usage. However, the present research highlighted that passive and active SNS use categories are not mutually exclusive

and that these classifications may be too broad to establish interactivity type and content consumption on Instagram. Future research exploring the overlapping facets of passive and active Instagram usage patterns would provide an avenue into exploring Instagram engagement and interaction more effectively, unifying conceptual differences of SNS usage research across platforms (Kaye et al., 2020), and identifying the nuances of SNS that are negative and beneficial to well-being.

Secondly, in light of the smartphone-based EMA and the passive objective monitoring implemented in the present project, it is also possible that this method induced assessment reactivity, whereby participants' usage and well-being experiences changed due to monitoring their behaviours (McCarthy et al., 2015). Due to restraints of the DiaryMood application development, participants had to input the passively collected data of Instagram usage manually into the DiaryMood app, which may have heightened their awareness of how they interacted and used Instagram throughout the week. Thus, future developments of the DiaryMood application and/or similar monitoring apps within research should consider the feasibility of automatically collecting participant SNS data without the need for user input, within the realms of participant privacy and data protection, to mitigate the possibility of reactivity effects. Nevertheless, the present study highlights DiaryMood's feasibility of collecting and deducing SNS and well-being patterns, making it viable to be adopted within larger scale studies to further establish the associations between user behaviour and well-being.

The current project has also highlighted that the concept of increased screen time when regarding SNS usage is not necessarily problematic in nature, as SNS can be used for a variety of different things, including finding support and connections online (Naslund et al., 2014). However, the present project has indicated that prolonged screen time could be problematic dependent on the content viewed and how this is interacted with by users. By

exploring more nuanced behaviours in future research, further understanding can be given to how specific behaviours are related to potential well-being outcomes, and how these behaviours may be attached to 'problematic' SNS use. For example, as discussed in Chapter 7, app launches can provide information mapping onto habitual use, and craving to use platforms. Exploring specific features such as this, can contribute to a more comprehensive understanding of the behaviours that encapsulate problematic SNS use, and towards establishing an operationalised definition of problematic use within research.

Establishing the concept of problematic usage is also important to facilitate understanding of SNS behaviours within contexts outside of research, e.g., clinical contexts. This project has highlighted that clinicians in the field of BDD would benefit from being able to distinguish between 'normal' and 'problematic' BDD social networking site usage, to help provide insight into the problematic behaviours attached to BDD SNS usage. Investigating BDD behaviours vs. non-BDD behaviours that may be associated with problematic SNS use (e.g., exploring the number of pictures liked on the Instagram platform through objective measures), would contribute towards gaining further understanding of how content liked maps onto well-being and body image perception and cognitions. In turn, this could contribute towards facilitating the ways in which clinicians approach BDD treatment and therapy when considering the role of SNS on BDD symptomatology, highlighting the importance of investigating specific features of SNS usage within research.

The mediating role of appearance anxiety is another avenue for future research. The present project indicated appearance anxiety as leading to symptoms associated with anxiety and depression as a result of problematic and passive Instagram usage in a non-clinical population. It has been demonstrated that appearance anxiety is associated with body image-based disorders such as BDD; however, high levels of appearance anxiety within non-clinical populations may be indicative of subthreshold levels of BDD (i.e., symptoms of the disorder

which can predict a clinical manifestation of BDD) (Wolitzky-Taylor et al., 2014). Thus, further research into the role of appearance anxiety in the context of SNS use and well-being in both non-clinical and clinical populations will contribute to the understanding and identification of subthreshold presentations of BDD in both research and clinical settings.

Moreover, future research should address the role of cyber-bullying on SNS platforms in the context of BDD populations. This research project has indicated that negative online comments and cyber-bullying may play a role in the exacerbation and maintenance of BDD symptoms. Exploring the extent to which online appearance-based bullying plays a role in BDD will help to further discern the ways in which SNS use may influence BDD symptoms and can go towards providing further clarity into the relationship between BDD and SNS within therapeutic treatment.

10.4 Implications

This project provides implications at research, clinical and corporate levels. At a research level, the development of DiaryMood provides a novel avenue into EMA and objective monitoring in the context of SNS and well-being. Given the complexities regarding studying the influences of SNS on users, there is a need for research to consider what this entails for different platforms, contexts and specific functions of SNS app use. As literature begins to draw upon the downfalls on the reliance of proxy measures of screen time and retrospective behaviour patterns (Kaye et al., 2020; Odgers & Jensen, 2020), EMA with objective monitoring can provide ecological patterns of behaviour to be observed. As such, the assessment of user behaviour in this manner can help to identify and understand how specific aspects of interactions (e.g., launches and length of time on SNS app) are associated with dynamic changes of user well-being, and can provide further insight into how these usage patterns map onto current psychometric scales (Shaw et al., 2016).

From a clinical perspective, the present research highlights the importance of discussing the role of SNS platforms with clients in treatment to establish the motivations behind their use of SNS. Through this, health professionals within therapeutic settings can focus on the specific mechanisms that may perpetuate symptoms and target these accordingly in treatment. Recognition of the role of SNS in BDD can provide the incentive to develop treatment avenues, for example utilising SNS as a form of exposure therapy within therapeutic settings. This can be informed by the present research as it has revealed that BDD individuals: (i) present anxiety around their appearance on SNS, (ii) use SNS to seek reassurance and feedback on appearance and (iii) may be motivated to use SNS in a similar manner to that of mirrors. Indeed, the use of mirror retraining has proved to be a valuable tool within BDD therapy (Wilhelm et al., 2014), and it is proposed that the use of SNS may provide similar advantages if employed carefully within treatment. In line with this, understandings of the role of SNS in BDD can create a foundation onto which suitable protocols could be developed to guide practitioners within assessments, in addition to utilising SNS in treatment effectively.

The present study also has implications at corporate level. The findings of this project highlight the detrimental effect on body image and well-being appearance-based content can have on users of SNS. Of note, the Instagram explore page was one feature of the platform that was regarded as being the worst for the promotion and dissemination of appearance-based content. In light of this, consideration should be made around the ways in which SNS platforms share image-based content, whilst also upholding transparency to consumers in regard to cookie preferences on SNS sites. Indeed, major platforms are beginning to acknowledge the influences specific SNS features may have on users, reflecting the gravity around the importance SNS users place on online interactions and content viewed online. For instance, due to research highlighting the pressure on users to attain likes and comments on

posts, Instagram trialled the removal of likes on Instagram to “depressurize” Instagram for users (Stevens & Griffiths, 2020). However, it should be noted that content providing support, entertainment, or appearance neutral content (e.g., animals, content pertaining to hobbies and interests) were also found in the present study to enhance well-being. This indicates the need for consideration that appearance-neutral content be more readily disseminated on pages such as the Instagram explore page. Accordingly, this doctoral project provides additional support regarding the features of Instagram and SNS that can contribute towards differential outcomes on well-being, and the significance consumers place on societal expectations and pressures of appearance online.

10.5 Final remarks

This doctoral project has highlighted the different aspects of Instagram use that can contribute towards outcomes in well-being, body image and BDD by examining the experiences of SNS in a non-clinical population, in addition to the experiences of individuals with BDD and the health professionals who work in the field of BDD. Findings of this project highlighted an interplay between online and offline peer and media influences, which subsequently endorsed appearance expectations on Instagram. For vulnerable individuals, such as those with BDD, the Instagram environment can contribute to the maintenance of maladaptive appearance cognitions. However, it was also emphasised that Instagram holds benefits in regard to well-being support and connections to others. In addition, the bespoke application DiaryMood was found to be a viable method for untangling associations between SNS patterns and well-being. Overall, findings of the present project provide support regarding the features of Instagram that can contribute to differential outcomes on well-being and body image, whilst also expanding the knowledge base on BDD and SNS behavioural patterns.

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APPENDICES

Appendix I

Declaration of Collaborative Work

Systematic reviews (Chapters 2 and 3) have been published in peer reviewed academic journals:

Ryding, F.C, & Kuss D.J. (2020). Passive objective measures in the assessment of problematic smartphone use: a systematic review. *Addictive Behaviors Reports, 11*, 100257. https://doi.org/10.1016/j.abrep.2020.100257

Ryding, F.C, & Kuss, D.J. (2020). The use of social networking sites, body image dissatisfaction and Body Dysmorphic Disorder: A systematic review of psychological research. *Psychology of Popular Media Culture, 9*(4), 412-435. https://doi.org/10.1037/ppm0000264

Contribution of first author (F.C. Ryding) to each of these systematic reviews:

- Initiation and development of ideas and design
- Literature search and collection
- Organisation of the literature
- Analysis of the literature
- Write up of the manuscripts
- Implementation of feedback provided by the co-author

Declaration of Co-Author Contribution: The content of the chapters presented in the thesis reflect the original and independent work completed by the first author (F.C. Ryding). Input from the additional co-authors was provided in the form of general feedback / guidance and manuscript edits in line with the normal working expectations of a PhD Student – Supervisor relationship. No original content in the thesis or accompanying journal articles was produced by any co-authors listed.

Appendix II

Confirmation of Ethical Approval from the Research Ethics Committee (CREC)

Non-clinical studies (Presented in Chapters 5,6 and 7):

Ethical application reference code: 2021/25 (final amended application)**.**

Clinical studies (Presented in Chapters 8 and 9):

Ethical application reference code: 2019/72.

Appendix III

Focus group schedule

Topics covered	Specific questions	Prompts
Introduction to online study and ground rules	Topics covered: what to expect from moderator and expectations of participants as a group; Acknowledgement of typing speeds [for online groups]; confidentiality and right to withdraw; code of conduct	
Introduction	What is your daily social networking site use like? (including SNS platforms you use most often?) What is it about social networking sites that motivates or influences you to use them? How would you describe Instagram in comparison to other platforms such as Facebook/ Snapchat or others that you use?	
Transition to main questions	What comes to mind when you hear the terms social networking and well-being together? How do you feel the use of social networking sites may influence well-being? Have a think about the platform Instagram. Is there anything about Instagram in particular that may influence well-being?	

	When viewing these images, how do they make you feel? How often do you encounter images such as these when you're on Instagram?	Images of influencers/ fitness models
	Do you think there are any positives of using social networking sites? Do you think that anything can be done to help with the impact of social media on well-being?	
Ending	Out of everything we've discussed, what do you think is the most important take home message (in terms of social media use and well-being)? Is there anything that we haven't talked about that you would like to add in regards to the topic?	

Appendix IV

Focus group theme audit

Theme audit

12 initial broad themes were structured by combining codes through an iterative process. 5 of these themes were then moved to become subthemes, condensing the initial 12 themes into 7 basic themes. These 7 themes were:

1. Awareness of how SNS can affect self
    a. Expectations on social media
2. Agency of social media use
3. Portrayal of people's lives online
    a. Influence of influencers on well-being
4. Self-presentation on Instagram
    a. Ability to enhance self of Instagram
5. Comparisons on SNS
6. Impacts on well-being
    a. SNS environment
    b. Negativity on SNS
7. Validation through SNS

Themes were then reviewed and further condensed and renamed to:

1. **Protection of well-being online**

    - *Agency and awareness of using SNS*

Agency of social media use was dismantled and codes that described an approach to mitigating negative well-being were put into a theme named 'protection of well-being online'. 'Agency of social media use' was renamed 'Agency and awareness of using SNS' as awareness of usage was often described as having an influence in control and agency of SNS use. This was then became a sub-theme of 'Protection of well-being online' as agency and

awareness was predominantly described in the context of well-being and limiting negative outcomes.

2. **SNS influences on well-being**

    - *Navigating the SNS environment*
    - *Conflict and criticism*

'Impacts on well-being' was changed to 'SNS influences on well-being' as participants described different features of well-being that may influence well-being, as opposed to direct impacts. The initial sub-theme 'Negativity on SNS' was thought to be too broad, and was renamed to 'conflict and criticism' as this best encompassed what was perceived as 'negative' across participants. The sub-theme 'SNS environment' was renamed 'Navigating the SNS environment' as this mainly embodied trying to find a way through the platform and trying to gauge the good from the bad and what's real vs. what's not.

3. **Constructing identity and portrayal of 'best self'**

    - *Self-presentation on Instagram*
    - *Ability to enhance self on Instagram*

Due to overlaps in 'Self-presentation on Instagram' and 'Ability to enhance self on Instagram', 'Self-presentation on Instagram' was reconsidered as to whether this should be a standalone theme. It was decided that 'Self-presentation on Instagram' would be more suitable as a subtheme within the overarching theme 'Constructing identity and portrayal of best self'.

4. **Comparisons to others**

    - *Seeking validation and social acceptance*
    - *Portrayal of others and the influence of influencers*

The ‘Portrayal of people’s lives online’ and ‘Influence of influencers on well-being’ were condensed into one subtheme ‘Portrayal of others and the influence of influencers’, due to overlapping descriptions of idealistic portrayals of people on SNS. ‘Validation through SNS’ was renamed ‘Seeking validation and social acceptance’ as the two were often intertwined during descriptions of looking for validation online. It was then decided that these would be suitable as subthemes under ‘Comparisons to others’ as comparing was generally described as what underpinned looking for validation and the opinions surrounding the portrayal of others/influencers.

Appendix V

Bergen Social Media Addiction Scale (BSMAS)

Instruction: Below you find some questions about your relationship to and use of social media (Facebook, Twitter, Instagram and the like). Choose the response alternative for each question that best describes you.

How often during the last year have you…

	Very rarely	**Rarely**	**Sometimes**	**Often**	**Very often**
…spent a lot of time thinking about social media or planned use of social media[1]	☐	☐	☐	☐	☐
…felt and urge to use social media more and more?[2]	☐	☐	☐	☐	☐
…used social media in order to forget about personal problems?[3]	☐	☐	☐	☐	☐
…tried to cut down on the use of social media without success?[4]	☐	☐	☐	☐	☐
…become restless or troubled if you have	☐	☐	☐	☐	☐

been prohibited from using social media?[5]					
…used social media so much that it has had a negative impact on your job/studies?[6]	□	□	□	□	□

Addiction component: [1]salience, [2]tolerance, [3]mood modification, [4]relapse, [5]withdrawal, [6]conflict. All items are scored on the following scale: 1 (Very rarely), 2 (Rarely), 3 (Sometimes), 4 (Often), 5(Very often).

Appendix VI

Appearance Anxiety Inventory

Appearance Anxiety Inventory

Please tick the box that best describes the way you have felt about your appearance of a specific feature OVER THE PAST WEEK, INCLUDING TODAY

Name_____ Date_____

		Not at all 0	A little 1	Often 2	A lot 3	All the time 4
1	I compare aspects of my appearance to others					
2	I check my appearance (e.g. in mirrors, by touching with my fingers, or by taking photos of myself)					
3	I avoid situations or people because of my appearance					
4	I brood about past events or reasons to explain why I look the way I do					
5	I think about how to camouflage or alter my appearance					
6	I am focussed on how I feel I look, rather than on my surroundings					
7	I avoid reflective surfaces, photos, or videos of myself					
8	I discuss my appearance with others or question them about it					
9	I try to camouflage or alter aspects of my appearance					
10	I try to prevent people from seeing aspects of my appearance within particular situations (e.g., by changing my posture, avoiding bright lights)					

	Total
Avoidance subscale	
Threat monitoring subscale	
Total	

Appendix VII

Hospital Anxiety and Depression Scale

Hospital Anxiety and Depression Scale (HADS)

Tick the box beside the reply that is closest to how you have been feeling in the past week.
Don't take too long over you replies: your immediate is best.

D	A		D	A	
		I feel tense or 'wound up':			**I feel as if I am slowed down:**
	3	Most of the time	3		Nearly all the time
	2	A lot of the time	2		Very often
	1	From time to time, occasionally	1		Sometimes
	0	Not at all	0		Not at all
		I still enjoy the things I used to enjoy:			**I get a sort of frightened feeling like 'butterflies' in the stomach:**
0		Definitely as much		0	Not at all
1		Not quite so much		1	Occasionally
2		Only a little		2	Quite Often
3		Hardly at all		3	Very Often
		I get a sort of frightened feeling as if something awful is about to happen:			**I have lost interest in my appearance:**
	3	Very definitely and quite badly	3		Definitely
	2	Yes, but not too badly	2		I don't take as much care as I should
	1	A little, but it doesn't worry me	1		I may not take quite as much care
	0	Not at all	0		I take just as much care as ever
		I can laugh and see the funny side of things:			**I feel restless as I have to be on the move:**
0		As much as I always could		3	Very much indeed
1		Not quite so much now		2	Quite a lot
2		Definitely not so much now		1	Not very much
3		Not at all		0	Not at all
		Worrying thoughts go through my mind:			**I look forward with enjoyment to things:**
	3	A great deal of the time	0		As much as I ever did
	2	A lot of the time	1		Rather less than I used to
	1	From time to time, but not too often	2		Definitely less than I used to
	0	Only occasionally	3		Hardly at all
		I feel cheerful:			**I get sudden feelings of panic:**
3		Not at all		3	Very often indeed
2		Not often		2	Quite often
1		Sometimes		1	Not very often
0		Most of the time		0	Not at all
		I can sit at ease and feel relaxed:			**I can enjoy a good book or radio or TV program:**
	0	Definitely	0		Often
	1	Usually	1		Sometimes
	2	Not Often	2		Not often
	3	Not at all	3		Very seldom

Please check you have answered all the questions

Scoring:
Total score: Depression (D) _____ Anxiety (A) _____
0-7 = Normal
8-10 = Borderline abnormal (borderline case)
11-21 = Abnormal (case)

Appendix VIII

Rosenberg Self-Esteem Scale

Rosenberg Self-Esteem Scale (RSE)

Below is a list of statements dealing with your general feelings about yourself. Please indicate how strongly you agree or disagree with each statement.

	Strongly Agree	Agree	Disagree	Strongly Disagree
1. On the whole, I am satisfied with myself.	☐	☐	☐	☐
2. At times I think I am no good at all.	☐	☐	☐	☐
3. I feel that I have a number of good qualities.	☐	☐	☐	☐
4. I am able to do things as well as most other people.	☐	☐	☐	☐
5. I feel I do not have much to be proud of.	☐	☐	☐	☐
6. I certainly feel useless at times.	☐	☐	☐	☐
7. I feel that I'm a person of worth, at least on an equal plane with others.	☐	☐	☐	☐
8. I wish I could have more respect for myself.	☐	☐	☐	☐
9. All in all, I am inclined to feel that I am a failure.	☐	☐	☐	☐
10. I take a positive attitude toward myself.	☐	☐	☐	☐

Appendix IX

Passive and Active Use Measure (PAUM)

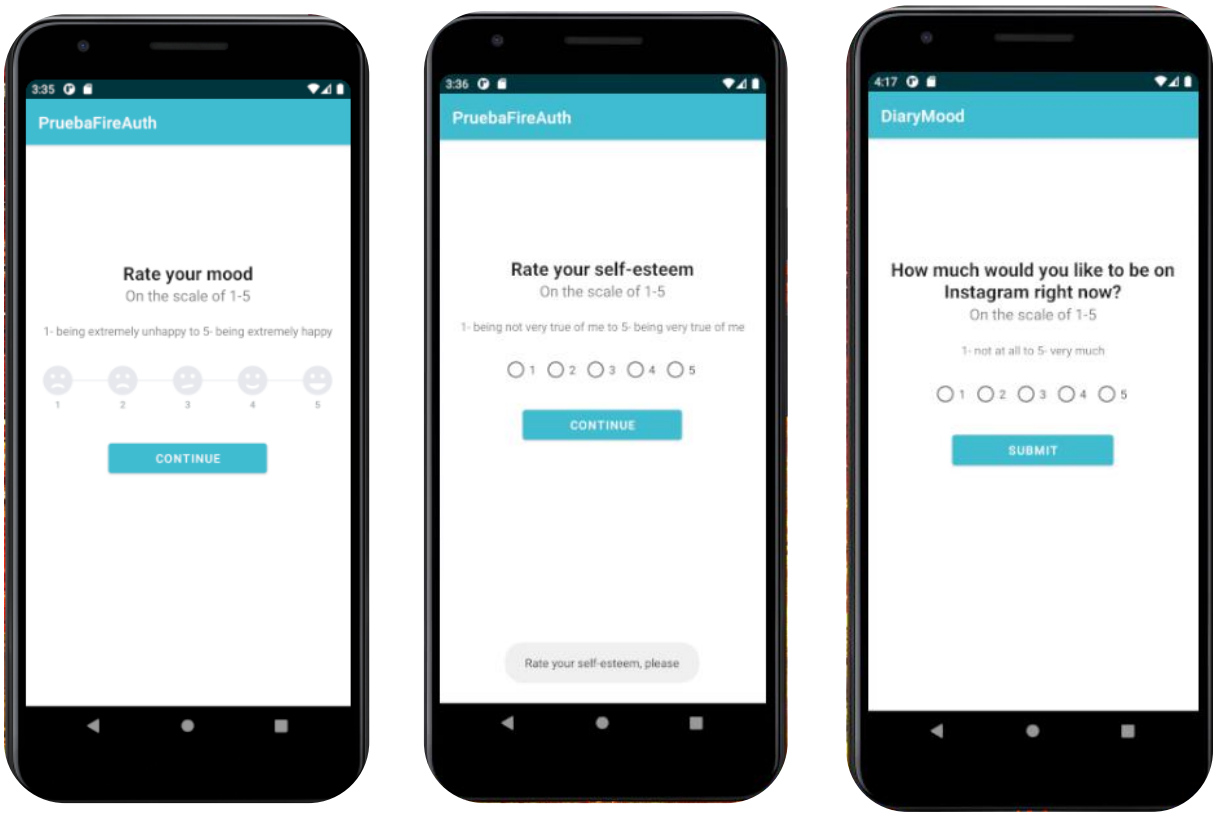
How frequently do you perform the following activities when you are on Instagram? (Note: Choosing "Very Frequently" means that about 100% of the time that you log on to Instagram, you perform that activity).

	Never (0%)	**Rarely (25%)**	**Sometimes (50%)**	**Somewhat frequently (75%)**	**Very frequently (100%)**
1. Commenting (on pictures, videos)	1	2	3	4	5
2. Chatting on direct message	1	2	3	4	5
3. Checking to see what someone is up to	1	2	3	4	5
4. Posting photos	1	2	3	4	5
5. Tagging photos	1	2	3	4	5
6. Viewing photos	1	2	3	4	5
7. Posting videos	1	2	3	4	5
8. Tagging videos	1	2	3	4	5

	Never (0%)	Rarely (25%)	Sometimes (50%)	Somewhat frequently (75%)	Very frequently (100%)
9. Browsing the newsfeed passively (without liking or commenting on anything)	1	2	3	4	5
10. Browsing the newsfeed actively (liking and commenting on posts, pictures and updates)	1	2	3	4	5
11. Looking through my friends' profiles	1	2	3	4	5

Appendix X

Scales for mood, self-esteem and craving as displayed in DiaryMood



Appendix XI

BDD Semi-structured interview schedule

Topics covered	Specific questions
Introduction to interview	Topics covered: what to expect from the interview; general overview of topic; confidentiality and right to withdraw; opportunity for questions
Introduction	Can you tell me about when you first started experiencing the symptoms of BDD? • How did you feel when they first started? Have you been/ how long has it been since you were clinically diagnosed with BDD? • Are you receiving treatment for it now? - How have you found this has helped/not helped? - Why? Was there anything in particular you found that made the symptoms worse or better? • What did you find made it worse/better? Why/ how?
Transition into main questions	Which social networking sites do you use most often? • Why these sites? How long do you find yourself spending on them? • Why? What is it about social networking sites that motivates or influences you to use them? • Do you use/How often you use Instagram? In regards to Instagram, are there any particular aspect(s) of the platform that you feel motivates you to use it? • Why/how?

	• When you use Instagram, what do you usually tend to do when you're on it? E.g. do you post things, comment, browse - Why? E.g. is there a reason as to why you engage in these activities more than others? Do you feel there is anything about Instagram that impacts your BDD symptoms either positively or negatively? • Why/how? Can you tell me about a time you've felt that using Instagram has affected your BDD symptoms, either positively or negatively? • When/ how? • Can you tell me more about how that made you feel at the time? - How long did the feeling last? • Did it affect the way you use Instagram? - How?
	More generally, do you find yourself comparing your features to others in real life? • (If so) how often would you say that you compare yourself to others? • What motivates you to engage in comparisons with others? - Why? How have you felt when you compare yourself to others? • How long does this feeling last? • To what extent do you feel that this affects the symptoms you experience? Have you ever found yourself comparing your features to others when on Instagram? • How have you felt when you compare yourself to others on Instagram? • Are there any differences in how you feel when comparing in real life and on Instagram?

	- Why/how? How do you feel the use of social networking sites may influence your BDD symptoms, either positively or negatively?
Ending	Is there anything that we haven't talked about that you would like to add in regards to the topic?

Appendix XII

Example of BDD theme development

Superordinate theme: *Agency online*		
Subordinate themes	**Emergent themes**	**Sample of quotes**
Lack of appearance control with SNS videos Self control online Lack of control in viewing content/Impacts to self-esteem Controlling Snapchat use due to loss of autonomy **Loss of control online**	Videos as more a risk than photos Lack of control in appearance Videos as increasing scrutiny of self -- Loss of timeframe online Loss of self control Regaining control online Autonomy Difficulty removing self from attractive content -- Lack of control with viewing influencers Unachievable Instagram as bad for self-esteem --	"you have a lot more control over one snapshot of yourself from a physical perspective whereas a video you've got frame upon frame upon frame that could possibly not look how you want (..) It might be obvious but in my head a video presents more of a risk" Lines 305-309; P2 -- "I'll be stuck on that page looking at how pretty her and her friends are and be like, you know and you'll be like you get on someone else's page that they're linked with and it's sort on down the rabbit hole of attractive people" Lines 439-442; P3 -- "even if I don't follow influencers or anything, they come up like whether you follow them or not, you're

	Snapchat as invasion of freedom Loss of autonomy from BDD development and SC use	going to see pictures of amazing, beautiful women who have completely unachievable bodies and (.) if I don't look at them my friends will share them, and as well, it's not just that for me, I feel like I'm, you know sometimes with the Instagram thing, in terms of Instagram being bad for your own sense of self-esteem" Lines 90-95; P4 -- ""my room was kind of somewhere where I was free from the outside world and there were, I I kind of had control of what entered and what, you know, what came in, but with with Snapchat it kind of, it kind of felt like people were knocking at my door when I was getting Snapchats, you know these were the things I had to attend to, right now" Lines 218-222; P7
Awareness of SNS use	Excessive SNS as impacting social relationships and awareness	" Instagram I'd say now, because I'd actively cut down my usage of the other two for

Consciousness of Instagram use Managing feelings on Instagram Development of Instagram use and perspective Controlling Snapchat use due to loss of autonomy **Regaining autonomy**	Actively cutting down Instagram use -- Protecting self on Instagram Consciousness of content followed Conscious of searching content Self-control Importance of positive content Educated perception of content as important Importance of self-restraint Managing SNS use -- Instagram as an space with photo focus Avoiding photos of self and others Curating Instagram as self-care Conflict around Instagram use Questioning management of BDD feelings --	the reasons that I expressed (..) I don't think I was particularly excessive in my use of them but (..) just reading things and seeing other people use them excessively I think I actively well I did I actively cut down my use of the other two and just stick to sort of one kind of social media platform" Lines 139-143; P2 -- "I definitely definitely made a conscious choice with who I follow, cause like and over the years I've sort of down I've deleted it and redownloaded it but I've never like deleted my Facebook account or the app of anything like that but Instagram I've sometimes found has really got to me, especially over summer when people are just constantly posting like holiday photos and stuff like that I find it really difficult" Lines 363-368; P3 -- "I've kinda curated my newsfeed to be quite positive,

	Actively limiting content followed Personal interests as developing Change in perspective of SNS content Deceptive Influencers and photoshop as unrealistic Unattainable	so I just look at pictures of dogs and I follow lots of body positivity stuff, mental health stuff, erm you know quite, quite self-love, nurture type things, so I guess part of what I like Instagram for is that kind of daily dose of um self-care maybe?" Lines 60-63; P4 -- "no I kind of, I try and limit things like that as much as I can just because obviously I'm constantly scrolling through, seeing like certain body types or like the complexion of someone's skin as well so like, I know in my head I'm like, that isn't real so there's no point like fixating on stuff like that because it's unattainable but at the same time viewing something like that can be quite stressful, even though you're aware that it's not real, so I do try to limit it as much as I can" Lines 89-94; P5 -- "definitely moving away from the more image based social media platforms has been

		really helpful for me and and I'm almost not sure of the causality there, if just me moving away has helped the BDD or as I've gotten better I've been less interested in that anyways" Lines 395-404; P7

Appendix XIII

Clinician Semi-structured interview schedule

Topics covered	Specific questions
Introduction to interview	Topics covered: what to expect from the interview; general overview of topic; confidentiality and right to withdraw; opportunity for questions
Introduction	Approximately how long have you worked in the field of BDD, and with individuals with the disorder? • Which qualifications (vocational/academic) do you hold?
Transition to main questions	Since working within the field, can you tell me about any observations you've seen in terms of smartphone and social networking site use in those with BDD? • Have you noticed any changes since smartphone and social networking site use has become more popular? • What kind of changes? • How have they affected those with BDD? To what extent do you feel that social networking sites can impact the symptoms of BDD? • How/ why do you think this? What do you think motivates or influences those with BDD to use social networking sites? • Why do you think this? • Would this differ from person to person in terms of expression of symptoms? • Why/how? In what ways do you think platforms with a more image based environment, such as Instagram affect those with BDD?

	What aspects of Instagram may motivate/influence those with BDD to use it? • Why/how? What ways do you feel social networking sites/ Instagram use may affect men and women differently in terms of the presentation of BDD symptoms? • Why/how? How does engaging in comparisons with others in real life affect the symptoms of those with BDD? To what extent do you feel that engaging in comparisons impacts those with BDD differently, if they are made on social networking sites as opposed to in real life? How do you feel that comparisons made through social networking sites may impact the symptoms of BDD? Are there any particular features of SNS that you think may impact the symptoms more? Have you experienced a time where the symptoms of BDD individuals have been affected either positively or negatively through using social networking sites? (Ideally through use of Instagram, but other SNS otherwise). • How did they feel/what were their symptoms like? • Why do you think it had that effect? When screening for BDD currently, what do you look for? - is excessive use of social networking sites considered at all? • (If no) Why/What do you think are the reasons for this? • Do you feel it is an important aspect to consider? What makes you think this?

	Do you think it would help in terms of screening for the disorder and treatment? • Why/how? • (If yes) Do you feel that this has helped in regards to the understanding the symptoms expressed by BDD individuals? • And in designing appropriate treatment/interventions? To what extent do you feel that excessive use of social networking sites may be a risk factor in the development and maintenance of BDD symptoms? Do you think that increased awareness of SNS use in BDD settings is/would be beneficial in screening and treatment? • Why/how?
Ending	Is there anything else that you would like to add?

Appendix XIV

Example of Clinician theme development

Superordinate theme: A clinician's *need for understanding*		
Subordinate themes	**Emergent themes**	**Sample of quotes**
"It's not the whole picture": Elucidating the role of SNS use in BDD	SNS use as explaining a part of BDD development Appearance related bullying in development of BDD -- SNS as not so influential in causing BDD SNS as maintenance rather than causative in BDD -- SNS as a part in BDD symptom development Different circumstances as contributing to BDD development -- Body image anxiety as culturally widespread Culture as becoming more preoccupied with body image	" I mean for somebody who has maybe sort of a predisposition to BDD (..) would probably be you know like social media can add a lot of pressure to kind of look a specific way to feel self-conscious so I think it can explain part of that development but not certainly the whole picture (..) and also social media is also a site where there's bullying [unintelligible] and it might be appearance related bullying and that's known to be a part in the development in BDD so yeah I'm sure there is a link in the development in BDD that can be explained in some cases with social media" Lines 277-284; P3 -- " I think there's some evidence that it's perhaps not as

	Values skewed in young people -- Appearance based bullying as playing role in BDD development Cultural beauty standards as contributing to BDD development Filters as a way of appearance being accepted Photos on SNS as reinforcing importance of appearance in BDD	causative as people might sort of worry but it is not a good and healthy association and there's clearly work to be done to tell people how a healthier relationship with social media as part of how helping helping them have a healthier relationship with their own body image" Lines 67-71; P4 -- " I'm sure it doesn't help [nods] but it's not a cause (…) it's just another piece of the jigsaw [risk factor that may contribute to BDD] and it's (..) you know you can't do anything about it" Lines 134-136; P5 -- " that's bound to *seriously* skew the value systems of young people growing up (..) so we're always saying in our therapy look look look, the whole self consists of so many different attributes, not just appearance (..) and we're kind of working against the tide" Lines 304-207; P1

		-- "but there's at least a little bit of initial evidence that bullying and appearance based bullying may play a role in the development of BDD and also that cultural messages about beauty and beauty standards can also play a role in the development of BDD and I think social media again sort of creates um (..) an environment where those things happen" Lines 155-159; P2
The "dangerous game" of SNS use: Recognising the	Understanding contributing behaviours towards BDD maintenance -- Understanding changes of behaviours before and after BDD onset Function of SNS as important in understanding --	" when we do our assessment it's part of the things that we have to do cause it's their worries about how they look so we've come away from the assessment of having a whole list of you know like do this in the morning or do this routine or this washing routine or erm you know you have to check in the mirror in certain ways or a certain amount of times etc and as part of that to understand social media use

motivations of BDD individuals in treatment	Understanding how to use SNS normally Understanding what normal Instagram use is as important Finding a balance Importance of *how* BDD people use SNS -- Importance of patient inclusion in treatment Encouraging recognition of effects of comparisons Attempting to reduce time spent on problematic comparison content Labelling process of comparisons online as most beneficial in treatment Encouraging awareness SNS evaluation as included in rituals in screening BDD SNS as more frequent in context of BDD	and if it's contributing to maintaining BDD then we can include it in treatment" Lines 264-270; P3 " I think the first step is kind of recognising that it's happening cause a lot of people will be doing it for so long that they don't notice when they're doing it and when they're spending the last hour looking online and looking at how this person looks and comparing it to themselves (..) so noticing what why is it a dangerous game, so noticing the effects it has on their their obsessions about how they look their feelings that they have about themselves so that they recognise that okay this is not perhaps the most helpful thing to do when I'm already not feeling when I'm already feeling insecure about myself perhaps going on Instagram and checking all these images and spending time looking at these models is not going to be helpful" Lines 186-194; P3

	SNS as part of BDD field SNS considered as part of BDD rituals Rituals as key part in maintaining BDD	-- “ as a commission we normally want to know like in most things we want to know what you’re doing less of, compared to what you used to do before the problem and what you’re doing more of compared to what you used to do and how does that function (…) you know like most things some people now will be avoiding social media (.) I think that’s probably less common and some people it’s not an issue and for others they’ll be using social media *more* frequently” Lines 229-235; P5 -- “ I’m not really sure what the normal way is this is [laughs] this is my disadvantage because I don’t use it, but this is what I reckon I think we need to develop what would normal Instagram use look like versus what would BDD Instagram use look like” Lines 171-174; P1