Exploring the potential benefits of social media in an autistic adult population: The association between online social connectedness, online masking, and self-esteem

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Thesis declaration form

I confirm that the work presented in this thesis is my own. Where information has been derived from other sources, I confirm that this has been indicated in the thesis.

Signature:

Name: Alice Potter

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Overview

Part One: Literature Review

Part one is a systematic review that explores links between social media use and social connectedness/disconnectedness in autism and ADHD. It focuses specifically on quantitative research.

Part Two: Empirical Paper

Part two is an empirical study that explores relationships between online social connectedness, online masking, and self-esteem in autistic adult social media users. Results suggest that higher levels of online social connectedness and lower levels of online masking are associated with higher levels of self-esteem. No significant interaction between online social connectedness and online masking was found in the main analyses. However, post-hoc sensitivity analyses found a significant interaction between online social connectedness and online masking for passive social media users.

Part Three: Critical Appraisal

Part three is a critical appraisal of the experience of carrying out the research project. It details reflections on the research process, challenges encountered, and considerations for future research and practice.

Impact Statement

Social media is a pervasive aspect of modern life, yet its impact on mental health remains heavily debated in research, policy, and public discourse, often through a concern-centric lens. Emerging research suggests that how individuals engage in social media – particularly for social connectedness – may play a critical role in wellbeing. The affordances of online communication may be particularly relevant for (some) autistic social media users to cultivate social capital. However, research exploring these relationships in autistic (and ADHD) populations remains limited, despite growing evidence of both benefits and risks associated with social media use. A more nuanced understanding of these relationships is essential for maximising social media's potential benefits whilst mitigating its harms.

The systematic review focused on links between social media use and social connectedness/disconnectedness in autism and ADHD users. Broadly, the findings supported an association between social media use and social connectedness for autistic users, and social media use and social disconnectedness for ADHD users. These differences may relate to core features of autism and ADHD, and how these interact with the affordances of social media and patterns of online behaviour. Additionally, the findings highlight the lack of consensus and heterogeneity in tools used in the field of social media research.

The empirical paper explored how autistic adults present themselves online, focusing on the relationship between online social connectedness, online masking, and self-esteem. The findings suggest that higher levels of online social connectedness and lower levels of online masking are associated with higher self-esteem. However, no significant interaction between online social connectedness and online masking was found – except in the passive social media users' subgroup.

The findings highlight that how autistic individuals use social media influences their self-esteem, and that individual differences matter when understanding the relationship between social media use and mental health outcomes.

Both papers point to social media's potential to cultivate social connectedness whilst also highlighting threats to acceptance and belonging for autistic (and ADHD) users. Additionally, the systematic review and empirical paper highlight the importance of integrating social media use into clinical practice to aid the conceptualisation of distress, and as a possible target for intervention.

In terms of research contexts, both studies highlight existing gaps in the literature and suggest areas for future research. Experimental and longitudinal research is needed to determine causal directions in the relationship between social media use and mental health outcomes in autism (and ADHD). Further exploration into individual differences in online engagement amongst neurodivergent populations would be useful. Future research should investigate how different platform affordances relate to social connectedness and mental health outcomes for autistic (and ADHD) users. Lastly, research should consider how social media is operationalised, and the use of validated measures to avoid the 'jingle jangle' problem that has dominated the field.

For both the systematic review and empirical paper, it is hoped that they will be published in peer-reviewed journals.

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Part One: Literature Review

A systematic review of the relationship between social media use and social connectedness/disconnectedness in autism and ADHD

Abstract

Aims: There is increasing interest in the relationship between social media use and social connectedness/disconnectedness, although little is known about the relationship in autistic and ADHD individuals. This paper aimed to systematically review empirical studies exploring links between social connectedness/disconnectedness and social media use in autism and ADHD, with the aim of exploring commonalities and differences in the experiences of autistic and ADHD individuals.

Methods: Systematic searches of four electronic databases were undertaken for all relevant studies in September 2024, with relevant literature reviewed and synthesised using a narrative approach. Inclusion criteria included a focus on autism/ADHD, social media, and social connectedness and/or disconnectedness. Eligible studies were assessed for study quality.

Results: Nineteen studies met inclusion criteria. Broadly, the results suggest a positive association between social media use and social connectedness for autistic individuals, and a negative association between social media use and social connectedness for ADHD users (i.e., social *dis*-connectedness). The included studies were limited by a predominance of cross-sectional designs and heterogenous conceptualisation and measurement of social connectedness and social media.

Conclusions: This systematic review highlights that social media may bring opportunities for increased social connectedness for autistic users, but threats of social disconnectedness for ADHD users, suggesting its value as a possible clinical intervention target. Longitudinal and experimental studies are needed to establish underlying directions of causality and the robustness of the findings.

Introduction

Social Media

Social media is a (near) ubiquitous aspect of modern life, with as many as 5.22 billion users world-wide (Statista, 2024), comprising 63.8% of the world's population. Given its widespread use, it is essential to understand the relationship between social media use and mental health outcomes.

Research suggests that higher levels of social media use are associated with poorer wellbeing (Twenge et al., 2017; Twenge & Campbell, 2018). However, it has been argued that investigating the relationship between social media and mental health from a 'dose-response' perspective (e.g., reducing engagement down to 'screen time'), over-simplifies the diverse ways in which social media interacts with daily life (Orben et al., 2020). A potentially more helpful approach is to consider *how* social media is engaged with (Orben et al., 2020). Since social connectedness and identity are closely related to mental health (Q. Yang et al., 2021), this may be a crucial factor in understanding social media engagement and associated wellbeing outcomes.

Social connectedness refers to the experience of acceptance and belonging to social networks and relationships (Lee & Robbins, 1995) and has been linked with mental health outcomes and mortality (Holt-Lunstad et al., 2010). For example, a scoping review of 66 longitudinal studies found that higher levels of social connectedness were protective of mental health outcomes like depression and anxiety (Wickramaratne et al., 2022), although 17% of the studies did not find an association. A systematic review of 32 longitudinal studies found that loneliness doubled the odds of developing depression, consistent across age groups from university students to older adults (Mann et al., 2022). The link between social

connectedness and mental health outcomes makes it essential to understand the contexts in which social connectedness might occur, like social media, particularly because of its growing ubiquity and use for social motivations.

Associations between Social Connectedness and Social Media Use

Social media offers opportunities for social connectedness through several processes, including the ability to form large social networks, maintain long-distance relationships, participate in online communities, and receive emotional support (Ellison et al., 2014; Ellison & Vitak, 2015; Ryan et al., 2017; Bányai et al., 2017). On the other hand, social media has also been linked to *threats* to connectedness, such as through cybervictimisation, online exclusion, and displacing offline relationships with time spent online (Allen et al., 2014; Tobin et al., 2015; Williams et al., 2000; Ryan et al., 2017).

A number of models have proposed that the capacity to connect and/or disconnect may be the primary driver for the risks and benefits of social media to mental health. For example, the Interpersonal-Connections-Behaviour-Framework (ICBF) (Clark et al., 2017) explicitly proposes that social media may be beneficial for wellbeing when used to foster social connectedness to meet an individual's needs of acceptance and belonging, but harmful if used in disconnecting ways (Clark et al., 2017; Tibber & Silver, 2022). Further, Tibber & Silver's (2022) transdiagnostic cognitive behavioural model of social media use extends the ICBF, conceptually linking social motivations and social approach behaviours to increased satisfaction of core social needs and other positive outcomes, and escapist/avoidant motivations and behaviours to decreased satisfaction of social needs and negative outcomes.

A growing body of evidence supports the ICBF (Q. Yang et al., 2021). For example, cross-sectional research has linked escapist motivations (Tibber & Silver,

2022) and passive social media use to poorer wellbeing (Thorisdottir et al., 2019; Wang et al., 2018; Burnell et al., 2019). In contrast, evidence suggests that when users engage with social media to cultivate meaningful connections (Tibber & Silver, 2022), greater social connectedness, positive wellbeing, and reduced loneliness may follow (Wang et al., 2014; Wang et al., 2018; Deters & Mehl, 2013; Huang, 2016). A critical review of social networking sites and wellbeing found that socially-connecting uses of social media (e.g., maintaining long-distance friendships) were associated with higher wellbeing, whilst socially *dis*-connecting uses (e.g., making social comparisons), were associated with lower psychological wellbeing (Verduyn et al., 2017).

Autism, Attention Deficit Hyperactivity Disorder, and Social Connectedness

Whilst social connectedness and disconnectedness appear to be critical to the putative harms and benefits of social media use, little is known about inter-individual differences that may be linked with risk and resilience in this regard (Valkenburg et al., 2021; Beyens et al., 2020; Beyens et al., 2024). One area of growing interest is neurodivergence, particularly autism and attention deficit hyperactivity disorder (ADHD).

Autism is a neurodevelopmental difference with 'core characteristics' (in terms of diagnostic criteria) including differences in social communication, behaviours, and sensory processing compared to non-autistic people (American Psychiatric Association [APA], 2013; World Health Organisation [WHO], 2019), experienced uniquely by each autistic person[1]. ADHD is also a neurodevelopmental difference

[1] This systematic review uses identity-first language instead of person-first language, as is currently preferred by much of the autistic community in the UK (Kenny et al., 2016; Bottema-Beutel et al., 2021). We acknowledge that preferences vary and are based on the individual. There is comparatively less consensus regarding the use of person-first and identity-first language in reference to ADHD, with preferences varying across individuals.

with ‘core characteristics’ including differences in levels of attention, energy, and impulsivity (APA, 2013; WHO, 2019). Autism and ADHD frequently co-occur, with more than 20% of individuals who have either autism or ADHD also receiving a diagnosis of the other condition (Hollingdale et al., 2020; Lai et al., 2019).

Autistic and ADHD individuals reportedly experience disproportionately high levels of negative social outcomes, including bullying (Accardo et al., 2024; Hellström, 2019), stigma and discrimination (Mazumder & Thompson-Hodgetts, 2019; Menezes et al., 2025; Masuch et al., 2019; Lebowitz, 2016). This may partly relate to differences in social presentation and communication for (some) autistic individuals (Sasson et al., 2017), and differences in attention and impulsivity for (some) ADHD individuals (McKay et al., 2023; Spender et al., 2023).

For example, research has demonstrated that neurotypical peers hold biases and make negative judgements about autistic individuals, which reduces their intentions to form relationships with autistic individuals (Sasson et al., 2017). From the perspectives of autistic adults, a qualitative study of 25 autistic adults found that lack of autism acceptance was central to their experiences of loneliness and negative social relationships (Elmose, 2019).

Similarly, 52 adults with ADHD in a qualitative study reported how a lack of acceptance leads to feelings of rejection, worsening their mental health (Schrevel et al., 2016). Difficulties in social relationships may increase autistic and ADHD individuals’ risk of social isolation (Underhill et al., 2019), loneliness (Kasari et al., 2014; Jong et al., 2024), and poorer mental health outcomes (Jong et al., 2024). A scoping review of 12 studies suggested that children with neurodevelopmental differences (including autism and ADHD) experienced loneliness, which was related to negative mental health outcomes (Kwan et al., 2020).

Given that autistic and ADHD individuals are at an elevated risk of negative *offline* social disconnectedness, the *online* world may provide an alternative context for social connectedness, a sense of belonging, and identity-affirmation (Understood, 2022; Alper, 2023; Dekkers & van Hoorn, 2022).

Associations between Social Media and Social Connectedness in Autism and ADHD

Although research into the experiences of autistic people on social media is relatively novel, there are preliminary findings suggestive of social media representing a valuable context for social connectedness and other positive outcomes (Wayman, 2021). For example, autistic adults in a qualitative study highlighted that their main reasons for using social media included staying connected with current relationships and forming new social connections (Wang et al., 2020). In a systematic review of nine qualitative studies of autistic women, social media was experienced as a supportive place regarding autistic affirming identities (Kelly et al., 2022). Features and affordances of online communication (e.g., reduced non-verbal cues and greater control over parameters of communication) may support online connectedness (Burke et al., 2010).

On the other hand, autistic social media users may also experience threats to social connectedness. A cross-sectional study of autistic users found that higher social media use was related to increased risk of cyberbullying and negatively associated with self-esteem due to feeling ignored (Triantafyllopoulou et al., 2022). In a systematic review of autistic individuals' internet use (Hassrick et al., 2021), although opportunities to strengthen community-identity were found, autistic individuals continued to experience feelings of loneliness and desired in-person friendships. Similarly, a qualitative study of 13 autistic young adults found that social

media provided opportunities to connect with friends and to meet new ones, but also gave rise to unpleasant interactions, which increased loneliness and negative mood (Leung et al., 2023). Features of online communication (e.g., emojis, GIFs, and hashtags for emotional expression) may create (greater) ambiguity in social communication, which may generate increased anxiety (Barros-Pena et al., 2023). Therefore, the extent to which autistic social media users experience social connectedness remains unclear.

For ADHD users, the research is even more limited. Perhaps even more so than in related autism research, the extant literature appears to be dominated by problem-saturated and deficit-focused narratives. Thus, there is a predominant focus on attempts to link ADHD 'symptomology' to problematic/addictive social media use (Schou-Andreassen et al., 2016; Gul et al., 2017; Dekkers & van Hoorn, 2022; Boer et al., 2020; Thorell et al., 2024).

Despite this, there is some preliminary evidence to support an association between social media and social connectedness for ADHD individuals. For example, female adolescents with ADHD have reported making friends online (Maya-Beristain & Wiener, 2020). A qualitative study of 43 adults with ADHD found positive aspects of online communities, including opportunities for connecting with similar others and identity-affirmation (Ginapp et al., 2023). However, participants also reported fears of rejection and not fitting in online. Additionally, ADHD (and autistic) individuals experience high levels of cyber-victimisation (Kowalski & Fedina, 2011), suggesting that social media may also threaten social connectedness for ADHD users. The potentially over-stimulating nature of online environments may be challenging for ADHD users who experience heightened impulsivity (Boer et al., 2020; Augner et al., 2023), which could impinge on positive online social experiences.

Overall, therefore, both sets of literature suggest a potential for social media to help harness social connectedness for autistic and ADHD individuals, and thereby facilitate satisfaction of core needs relating to acceptance and belonging. In parallel, however, the literature suggests that the online context has the potential to mirror negative offline social experiences, posing a threat to social connectedness, both of which have potentially important implications for mental health outcomes (Clark et al., 2017; Tibber & Silver, 2022).

Aims of the Review

This paper aims to systematically review empirical studies that explore links between social connectedness/disconnectedness and social media for autistic and ADHD users, and sets out to explore both commonalities and differences in these literatures and in the online experiences of autistic and ADHD populations. Whilst existing reviews have explored associations between social media use and social connectedness or related variables of social connectedness/disconnectedness (O'Day & Heimberg, 2021; Wright et al., 2023), and social media use and autism/ADHD (Hudson et al., 2023; Hassrick et al., 2021; Dekkers & van Hoorn., 2022), to the author's knowledge, no reviews have explored these three topics together and/or specifically compared autistic and ADHD social media users. Such insight into these social processes and outcomes for autistic and ADHD individuals could help to ameliorate the risks and promote the benefits of using social media.

Due to the relative novelty of the area, the following broad research questions guided this review:

1. What is the relationship between social media use and social connectedness/disconnectedness in autism?

2. What is the relationship between social media use and social connectedness/disconnectedness in ADHD?
3. What, if anything, is common across autism and ADHD in terms of the relationship between social media use and social connectedness/disconnectedness?
4. What, if anything, is different across autism and ADHD in terms of the relationship between social media use and social connectedness/disconnectedness?

Methods

This review aims to synthesise quantitative research on social connectedness and disconnectedness in autistic and/or ADHD social media users. Methods and results are conducted and reported according to PRISMA guidelines (Page et al., 2021). This review did not use a meta-analytic approach; aggregating effect sizes where studies vary in operationalisation of constructs, methodology, and analytic approaches is unsuitable (Sharpe, 1997). Consequently, this review undertook a narrative synthesis of the literature. The objective was to highlight key findings in the literature, evaluate the strengths and limitations of the included papers, and provide ideas for future research. We registered the study protocol with PROSPERO (registration number: CRD42024591737).

Search Strategy

A systematic search to identify relevant articles was conducted (17.09.24). The following bibliographic databases were searched: MEDLINE (Ovid), PsycINFO (Ovid), Embase (Ovid), and Web of Science (Core Collection).

The search terms used were based on the three key concepts: (1) social connectedness/disconnectedness, (2) autism/ADHD, (3) social media.

Conceptualisations of the three key concepts are described below. In Ovid platforms (MEDLINE, PsycINFO, and Embase), terms were mapped to subject headings to facilitate a comprehensive search.

Social Connectedness and Disconnectedness

A broad conceptualisation of social connectedness/disconnectedness was adopted for this review, aligned with Lee and Robbins' definition of social connectedness as relating to the experience of being part of a relationship, group, community or network (Lee & Robbins, 1995), linking to an individual's sense of belonging and acceptance. Social disconnectedness – arguably the inverse of social connectedness – was conceptualised broadly as any negative experiences of social relationships, like social isolation, rejection, and loneliness (Bowins, 2021). A broad range of search terms were used to capture the diversity of terminology used to describe social connectedness/disconnectedness, with the aim to return the maximum number of papers.

Terms for social connectedness/disconnectedness were generated by identifying synonyms and relevant literature, including key theoretical papers, and key scoping and systemic reviews (e.g., Dewa et al., 2021; Pahl et al., 2021; Lee & Robbins, 1995; Santini et al., 2020; Valtorta et al., 2016; Holt-Lunstad., 2010; McPherson et al., 2014), alongside general language usage.

Autism and ADHD

Relevant synonyms and related terms for autism and ADHD were derived from general language, key systematic reviews (Hudson et al., 2023; Hassrick et al., 2021; Thorell et al., 2024), and major diagnostic classification systems, including the ICD-10 (WHO, 1992), ICD-11 (WHO, 2019), DSM-4 (APA, 1994), and the DSM-5 (APA, 2013).

Social Media

Informed by ideas of user generated content (UGC) and Web 2.0 (Kaplan & Haenlein, 2010), social media was conceptualised broadly as digital technology and platforms where information and ideas can be created and shared, with the ability to communicate with others. Studies *exclusively* focusing on gaming, text messaging, and emailing were not included, however, since these forms of media were considered to substantially deviate from a Web 2.0-based conceptualisation based on the notion of UGC/profiles.

General terms for social media, allied technologies, and broader concepts like computer-mediated communication (CMC), were informed by synonyms used within general language, and multiple sources in the literature, key systematic and conceptual reviews (Hudson et al., 2023; Hassrick et al., 2021; Meier & Reinecke, 2021; Nesi et al., 2018; Boyd & Ellison, 2007; Kaplan & Haenlein, 2010) and popular platform names (Statista, 2024).

This generated 31 search terms for social connectedness/disconnectedness, 16 search terms for autism/ADHD, and 46 search terms for social media. The search terms for each key concept were grouped using the OR operator and were subsequently combined using the AND operator. See Appendix 1 for full details.

Inclusion and Exclusion Criteria

Studies were considered suitable for inclusion according to the following criteria: (i) written in English; (ii) original quantitative study; (iii) peer reviewed and published; (iv) included a measure of social connectedness/disconnectedness; (v) included diagnosed or self-identifying autistic and/or ADHD participants (or parents/caregivers reporting on their child's experience); (vi) included a measure related to social media use; (vii) conducted the year of or after the first social media

site was created (i.e., Six Degrees, established in 1997). There were no demographic restrictions in terms of age, gender, or ethnicity.

Screening and Selection

A combination of EndNote reference management software (Clarivate, 2023) and Rayyan (Qatar Computing Research Institute, 2016) were used to organise the retrieved papers. Duplicates were removed both manually and by using the EndNote function. Guidance to remove duplicates following retrieval of a large number of papers was followed to ensure accuracy (Falconer, 2018).

Studies were screened in two steps. Firstly, titles and abstracts of all retrieved studies were read for relevance to the three key concepts. In cases of ambiguity due to insufficient information, studies were moved to the second step. In the second step, articles were read in full to assess whether to remove studies that failed to meet the inclusion criteria. A second reviewer (blind to the first reviewer's decisions) independently screened 15% of the papers at both phases to reduce the likelihood of bias. A third reviewer (also blind to the first reviewer's decisions) screened 100% of the included papers for quality assessment. Any disagreements were resolved through discussion.

Data Extraction and Quality Assessment

All studies meeting inclusion criteria were coded for key variables to support the synthesis of findings and evaluate study quality. These included: date of data collection; country study was conducted in; sample size; sample population; summary participant demographics including age, gender, ethnicity; method of data collection; sampling strategy; study design; participant group (e.g., autistic, ADHD, both); formal or self-identified nature of diagnosis; details of respondent (self-report, parent/caregiver, both); any other neurodevelopmental differences and/or mental

health difficulties reported; type of social media(s) examined; measure(s) of social media included; measure(s) of social connectedness/disconnectedness included; type and level of analyses undertaken; any sub-analyses included; other variables/covariates modelled; key findings and associated significance; information to assist with assessment of study quality.

The Standard Quality Assessment Criteria for Evaluating Primary Research Papers (Kmet et al., 2004) was used to assess the quality of the eligible studies. This tool can be used to evaluate a variety of study designs using 14 criteria (see Appendix 2). Each study was assessed for the degree to which it met each of the criteria (2 = Yes, 1 = Partial, 0 = No, Not Applicable = NA). Summary scores (indicating the overall quality of the paper) were calculated for each paper.

To assess study quality more rigorously, three additional custom-written criteria were used: (i) presence of measures of effect size for main outcomes (yes/no); (ii) whether outcomes were assessed using valid and reliable measures of social connectedness/disconnectedness (yes/no); (iii) whether outcomes were assessed using valid and reliable measures of social media (yes/no). These were scored separately from the above (see Appendix 2 for scoring information).

A request was made to the authors of the study in cases of missing information.

Results

Study Selection

Figure 1 is a PRISMA flow diagram (Page et al., 2021) of the screening and study selection process. The search yielded 10,307 papers. Of the 453 papers that were full-text screened, the principal reasons for exclusion were lack of measures for

key constructs (social media, social connectedness/disconnectedness), research design, and participant population. Inter-rater agreement at the title and abstract stage was 98.4%, and 95.6% at the full-text stage. Discrepancies were resolved through discussion. Forward and backward citation searching was completed for the 19 papers that met inclusion criteria. This did not yield any further papers. As such, 19 papers were included in the systematic review[2].

Overview of Study Characteristics

See Table 1 for an overview of study characteristics and main findings; additional details are provided in Appendix 3.

All 17 studies were published between 2013 and 2024, reflecting the relative recent development and uptake of social media. Data were collected in the USA (*N* = 8, 47.06%), Canada (*N* = 3, 17.65%), Taiwan (*N* = 2, 11.77%) and Turkey (*N* = 2, 11.77%), with single studies from The Netherlands and Israel.

Nine studies focused on autistic participants (52.94%), and eight on ADHD (47.06%). Of the autism studies, three (33.33%) indicated that a portion of the autistic participants had co-occurring ADHD. Of the eight ADHD studies, six excluded participants with co-occurring autism (75%). Ten studies (58.82%) included neurotypical participants.

Sample sizes ranged from 23 to 15,240 (*M* = 1091.24, *SD* = 3650.04; *Mdn* = 128). For autistic participants, samples ranged from 23 to 664 (*M* = 105.67, *SD* = 81.06); for ADHD, 65 to 251 (*M* = 199.13, *SD* = 197.00).

[2] After contacting the primary researcher, it was confirmed that three papers were based on the same dataset (Wright, 2017; Wright, 2018; Wright & Wachs, 2019). Therefore, the three papers were treated as a single study for the overview of study characteristics to avoid double-counting. However, main findings are reported separately, as each paper presented distinct outcome measures. One paper (Wright, 2018) reported a slightly reduced sample due to attrition, leading to minor demographic differences (see Table 1).

Participant age ranged from 6 to 84 (14 studies reported this data), with an overall mean of 18.27 (*SD* = 8.91; 15 studies). ADHD participants had a mean age of 15.01 (*SD* = 1.95); autistic participants had a mean age of 21.79 (*SD* = 11.36).

Most autism (7 of 9, 77.78%) and all ADHD studies had a higher proportion of males (vs. females). Only two studies (11.77%) reported where participants identified as a gender identity other than male/female.

Nine of the 17 studies (52.94%) did not report information regarding ethnicity. Of those that reported, all eight (100%) reported 'White/Caucasian' participants as the largest ethnic group.

Data collection methods included online surveys (*N* = 6, 35.29%), in-person surveys (*N* = 9, 52.94%), direct analysis of Facebook profiles (*N* = 2, 11.77%), and one study (Tuncturk et al., 2023) used interviews.

The sampling strategies included convenience (*N* = 7, 41.18%), volunteer (*N* = 8, 47.06%), random selection (*N* = 1, 5.88%), and multiple stratified sampling (*N* = 1, 5.88%).

The most common study design[3] was cross-sectional (*N* = 16, 84.21%). Two had longitudinal designs (10.53%) and one had a retrospective cohort study design (5.26%).

Ten studies used existing, established measures (52.63%)[4], whilst nine (47.37%) created custom measures or adapted existing measures for social media. Apart from the three studies based on a single dataset (Wright, 2017; 2018; Wright & Wachs, 2019), no studies used the same measure of social media. Social media

[3] Due to difference in study design in Wright (2018), study design characteristics were calculated based on *N* = 19.
[4] Due to differences in measures used across all three papers, characteristics reported for constructs were calculated based on *N* = 19.

constructs included cyberbullying, frequency of use, internet addiction, and examining Facebook profiles directly.

Twelve studies (63.16%) used established and validated measures of social connectedness/disconnectedness, whilst seven (36.84%) used custom measures or adapted versions of existing questionnaires. The most used measure was different versions of the UCLA Loneliness Scale (Russell et al., 1978) (*N* = 4, 21.05%), and two studies (11.77%) used the Multidimensional Scale of Perceived Social Support (Zimet et al., 1988). No other scales were repeated across studies. Other social connectedness constructs included relational closeness, friendship qualities, and online cognition.

Figure 1

PRISMA Diagram

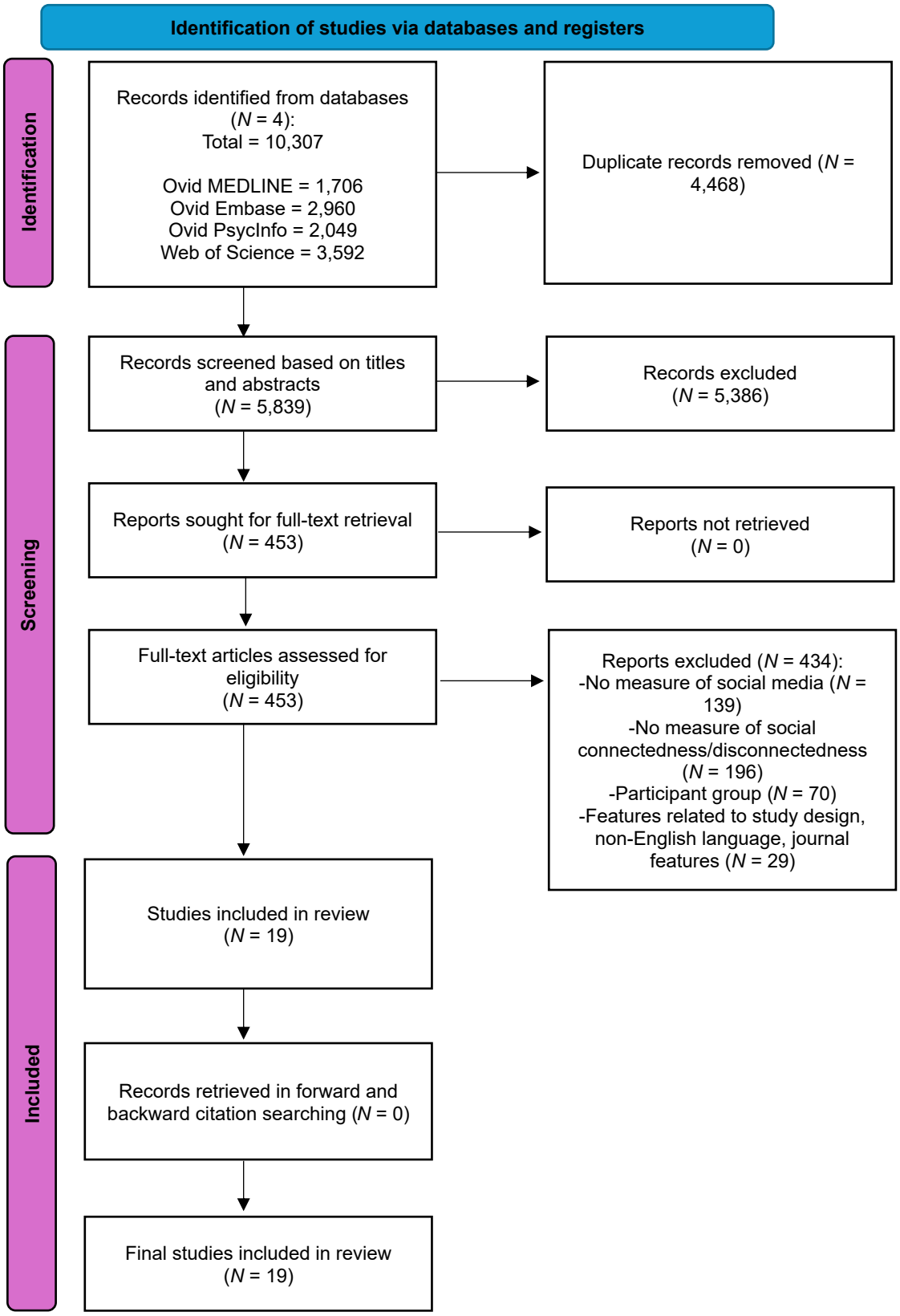

Table 1

Study Characteristics and Main Findings

Study	Sample Size	Participant Characteristics	Study Design	Measure of Social Connectedness/Disconnectedness	Measure of Social Media	Main Findings
Alhujaili et al., (2022)	Total Sample *N* = 50. (Autistic *N* = 26, Non-Autistic *N* = 24)	13-18yrs; Autistic: 46% male, 6% female, 0% other; Controls: 6% male, 40% female, 2% other; ethnicity not reported.	Cross-sectional	Reasons for using SM, reasons for preferred SM site, online friendships (custom developed scale).	Time spent & patterns of social media use (devices, activity, time, days of the week) (custom developed scale).	Significant difference in purpose of SM site use in autistic & control groups (p = .008). Predominant purpose in autistic group = entertainment; control group = social interactions.
Cardy et al., (2021)	Total Sample *N* = 414. (Autistic *N* = 127)	Autistic: *mean* age = 11.7 (*SD* = 4.06); 77.95% female, 63% White; Controls: *mean* age = 9.4 (*SD* = 4.26), 59.63% female, X% White; TD Subgroup: 58.04% female; ethnicity not reported.	Cross-sectional	Domains of benefit of technology use (e.g., coping with social isolation) (adapted from existing instruments: Moore et al., 2020; CRISIS, 2020).	Modes of technology use, activity & time spent on devices (adapted from existing instruments: Moore et al., 2020; CRISIS, 2020).	Statistically higher likelihood of benefitting from screen time to cope with social isolation in autistic relative to non-autistic children (p = .003). Autistic children also lost significantly more time on social interactions (offline) than community comparison group (p < .001).
Dawson et al., (2019)	Total Sample *N* = 58	13-16yrs, *mean* age = 14.48 (*SD* = 0.84); 72.4% male; 81.1% White.	Cross-sectional	Facebook Coding Manual (Mikami & Szwedo, 2013) of Facebook Social Behaviours.	Adapted version of Online Behaviour Demographic Questionnaire (Lenhart, 2015); access to Facebook profiles.	Facebook use associated with weaker online connectedness & less support from friends. 'Friends' significantly more likely to make relationally aggressive posts towards ADHD individuals than vice versa (p = .002), & more likely to "react" than to make a post of relational quality (p < .001). ADHD users expressed less connectedness (p = .014) & support (p = .002) than received by friends. Having a greater number of Facebook friends was negatively associated with proportion of friends posting on participants' timelines (r = -0.42, p = .016).

Study	Sample Size	Participant Characteristics	Study Design	Measure of Social Connectedness/Disconnectedness	Measure of Social Media	Main Findings
Gillespie-Lynch et al., (2014)	Total Sample *N* = 657. (Autism Diagnosis *N* = 204, Self-Identifying *N* = 87, Not Autistic *N* = 311)	Autistic (diagnosed): *mean* age = 32.32 (*SD* = 11.21), 67.2% female, 81.4% Caucasian; Self-identifying: *mean* age = 34.32 (*SD* = 12.37), 64.4% female, 82.8% Caucasian; Controls: *mean* age = 34.89 (*SD* = 13.13), 76.5% female, 76.5% Caucasian.	Cross-sectional	Communicative Benefit and Preferred Functions of the Internet (adapted from Benford, 2008).	Social media use (including time spent) (custom developed scale).	Autistic adults used internet to meet people with same interests & to meet people like them more than non-autistic adults ($p < .001$). Autistic adults used internet to look for a significant other more than non-autistic adults ($p < .05$).
Gorucu et al., (2020)	Total Sample *N* = 124. (ADHD *N* = 65, Non-ADHD *N* = 59)	Total sample age 11-18yrs, *mean* age = 14.6 (*SD* = 1.5). ADHD: 78.3% male; Controls: 76.9% male; ethnicity not reported.	Cross-sectional	Online Cognition Scale (Davis et al., 2002 - validated in Turkish by Ozcan & Buzlu, 2005).	Cyber Bullying Scale (Aricak et al., 2012a); Cyber Victimization Scale (Aricak et al., 2012b); Smartphone use, personal computer use, internet use (custom developed scale).	ADHD non-cyberbullies score higher on the loneliness subscale ($p = .032$) than non-ADHD non-cyberbullies. ADHD non-cybervictims scored higher than non-ADHD non-cybervictims on loneliness subscale ($p = .007$), social comfort subscale ($p = .012$), & overall score ($p = .009$).
Heiman et al., (2015)	Tota Sample *N* = 482. (ADHD *N* = 140, Non-ADHD *N* = 342)	12-16yrs. ADHD: *mean* age = 14.73 (*SD* = 1.18), 73.6% male; Controls: *mean* age = 14.23 (*SD* = 1.14), 55% female; ethnicity not reported.	Cross-sectional	Loneliness Questionnaire (Williams & Asher, 1990 - adapted into Hebrew by Margalit, 1991); Multidimensional Scale for Social Support (Zimet et al., 1988 - translated into Hebrew by Drori, 1998); Self-Efficacy Questionnaire for Children (Muris, 2001 - translated into Hebrew by study authors).	Cyberbullying Questionnaire (Smith et al., 2008), Internet use (custom developed scale).	Higher levels of loneliness (social = $p < .01$; emotional = $p < .001$), lower levels of self-efficacy (social = $p < .001$; emotional = $p < .001$) & social support (friends = $p < .01$) in ADHD cybervictims relative to non-victims. ADHD cyberwitnesses reported higher feelings of loneliness (social = $p < .05$); emotional = $p < .01$) & lower belief in their social self-efficacy ($p < .05$) than the non-ADHD individuals. ADHD, cybervictimisation, & lower social support found to predict loneliness ($p < .001$).
Holfeld et al., (2019)	Autistic *N* = 23	10-17yrs, *mean* age = 13.7 (*SD* = 2.4); 78.26% male; 91.3% Caucasian.	Cross-sectional	Multidimensional Scale of Perceived Social Support (Zimet et al., 1988).	Technology Access and Use (including time spent & frequency of use) (custom developed scale); Behavioural index of cyberbullying offending & victimisation (adapted from Patchin & Hinduja 2010).	Perceived social support not correlated with technology use as measured in autistic participants.

Study	Sample Size	Participant Characteristics	Study Design	Measure of Social Connectedness/Disconnectedness	Measure of Social Media	Main Findings
Kuo et al., (2014)	Autistic *N* = 91	12-18yrs, *mean* age = 14.8 (*SD* = 1.9); 81% male; ethnicity not reported for young people (parents 99% White).	Cross-sectional	Friendship Qualities Scale (Bukowski et al., 1994).	Media use (weekly activity reports) (custom developed scale).	Autistic adolescent SNS users reported greater friendship than autistic non-users (p = .030). Autistic adolescents who visited sites to establish or maintain relationships reported more positive overall friendships than autistic users who did not (p = .031).
Lin et al., (2024)	Total Sample *N* = 15,240. (ADHD *N* = 664, Non-ADHD *N* = 14,576).	Total sample *mean* age = 15.24; ADHD: 78.08% male; Controls: 50.97% male; ethnicity not reported.	Population-based retrospective cohort study	6-items adapted from Student School Survey (Hamburger et al., 2011) to measure Campus Atmosphere; 3-tems adapted from Social Support (Barrera et al., 1993) to measure Family Support.	Adapted version of Measuring Bullying Victimisation, Perpetration, & Bystander Experiences (Hamburger et al., 2011).	Social support associated with lower risks of cyberbullying (aOR = 0.95, p < .013). Family monitoring protective of cyberbullying (aOR = 0.98, p < .013). No interaction effect with ADHD.
Marsh et al., (2022)	Total Sample *N* = 288. (ADHD *N* = 151, Non-ADHD *N* = 137)	13-15yrs; ADHD: *mean* age = 14.06 (*SD* = 0.36), 64.2% male, 81.5% White; Controls: *mean* age = 14.11 (*SD* = 0.35), 55.5% male; ethnicity not reported.	Cross-sectional	Social Media Use Integration Scale (SMUIS), Social Integration & Emotional Connectedness Subscale, & SMUIS-Parent Version (Jenkins-Guarnieri et al., 2013).	3-items from adolescent report technology use measure to create a composite of Daily Online Technology Use (Pea et al., 2012).	Significant interaction between cybervictimisation & (parent-reported) SIEC to SM for anxiety & depression greater cybervictimisation associated with higher levels of anxiety (t = 3.22, p = .001) & depression (t = 5.67, p < .001) for adolescents with greater SIEC to SM. Interaction between cybervictimisation & SIEC to SM not different for adolescents with/without ADHD. ADHD status not significantly correlated with either adolescent reported (r = -0.06, p > .05) or parent reported (r = -0.03, p > .05) SIEC to SM.
Mazurek (2013)	Autistic *N* = 108	18-62yrs, *mean* age = 32.4 (*SD* = 12.5); 52.8% male; 88.0% Caucasian.	Cross-sectional	Friendship Status; Unidimensional Relationship Closeness Scale (Dibble et al., 2012); UCLA Loneliness Scale (8-item version) (Hays & DiMatteo, 1987).	Time spent on SM, platforms used, & SM friendship status (custom developed scale).	Autistic SNS users had greater percentage of best friends (66.3%) than non SNS users (33.3%) (p = .006). Autistic individuals using SNS for social reasons had higher relationship closeness than autistic individuals using for non-social reasons (p = .049). Users & non-users of SNS did not differ in levels of loneliness (p = .90), & SNS use alone did not predict loneliness (p = .49).

Study	Sample Size	Participant Characteristics	Study Design	Measure of Social Connectedness/Disconnectedness	Measure of Social Media	Main Findings
Mikami et al., (2015)	Total Sample T1 *N* = 228. (ADHD *N* = 140). Total Sample T2 *N* = 209. Total Sample T3 *N* = 216	T1 = 6-12yrs. (*M* = 9.6). T2 = 11-18yrs. (*M* = 14.1). T3 = 17-24yrs. (*M* = 19.6). 100% female; 53% White across T1-T3.	Longitudinal cohort study	Interaction with strangers online (Morahan-Martin & Schumacher, 2003); Quality of Online Interactions (using Facebook Profiles); Peer Sociometric Preference (Coie et al., 1982) & Teacher Report of Peer Acceptance (Dishion & Kavanagh, 2003).	24-item questionnaire of Preference for Online Communication (Szwedo et al., 2011; Morahan-Martin & Schumacher, 2003); access to Facebook profiles.	Childhood ADHD predicts online social communication in adulthood: greater stated preference for online over offline communication $p = .040$) & more interactions with strangers online ($p = .011$) than neurotypicals. Childhood ADHD predicts less connectedness ($p = .011$), & less support ($p = .034$) observed in friends' posts on Facebook posts, & fewer Facebook friends ($p = .012$) in adulthood.
Tuncturk et al., (2023)	ADHD *N* =124	12-18yrs, *mean* age = 14.3 (*SD* = 1.7); 100% male; ethnicity not reported.	Cross-sectional	UCLA Loneliness Scale (8-item version) (Hays & DiMatteo, 1987 - translated into Turkish by Yildiz & Duy, 2014).	Internet Addiction Scale (Bayraktar, 2001; Young, 1996); Revised Cyber Bullying Inventory-II (Topcu & Erdur-Baker, 2018).	ADHD Problematic Internet Users have lower levels of perceived loneliness compared to ADHD Internet Gaming Disorder participants ($p < .001$).
van der Aa et al., (2016)	Total Sample *N* = 185. (Autistic *N* = 113, Not-Autistic *N* = 72)	Autistic: *mean* age = 40.2 (*SD* = 12.3), 55.9% male; Controls: *mean* age = 40.5 (*SD* = 12.1), 61.1% male; ethnicity described as Dutch nationality and some Belgian participants. No other information reported about ethnicity.	Cross-sectional	Online Friendships & Appreciation of CMC; Satisfaction with One's Online Social Life (adapted Diener et al's 1985 satisfaction with Life Scale); 6-items from UCLA Loneliness Scale (Russell et al., 1980).	Time spent, channels used, appreciation of CMC, & Online Friendships (adapted from Valkenburg & Peter, 2007).	Autistic individuals have more online acquaintances than controls ($p = .006$) & more friends or acquaintances through CMC that they would not have known otherwise ($p < .001$). Only significant predictor for satisfaction with online social life was CMC use ($p = .011$); no significant interaction with autism.
van Schalkwyk et al., (2017)	Total Sample *N* = 100. (Autistic *N* = 44, Not-Autistic Controls *N* = 56)	12-19yrs. Autistic: *mean* age= 14.86 (*SD* = 2.04), 70.5% male; Controls: *mean* age = 15.11 (*SD* = 1.73), 62.5% female; ethnicity not reported.	Cross-sectional	Parent and child versions of The Friendship Questionnaire (Bierman & McCauley, 1987); SM Experience Scale.	Time spent using SM and SM Experience Scale (custom developed scale from previous qualitative study – van Schalkwyk et al., 2015).	SM use associated with higher friendship quality in autistic adolescents ($p < .05$). Anxiety levels moderated this relationship ($p < .05$): in those with lower anxiety levels, SM use associated with better friendship quality ($p < .05$).

Study	Sample Size	Participant Characteristics	Study Design	Measure of Social Connectedness/Disconnectedness	Measure of Social Media	Main Findings
Wright (2017)	Autistic *N* = 128	11-16yrs; 89% male; 86% White.	Cross-sectional	Revised UCLA Loneliness Scale (Russell, 1996).	Cybervictimisation Questionnaire (Wright & Li, 2013); Parental Mediation of Technology Use (Arrizabalaga-Crespo et al., 2010).	Parental mediation of technology use for autistic adolescents negatively associated with loneliness whilst controlling for other variables ($p < .05$). Interaction effect between cybervictimisation & social support: relationship between cybervictimisation & depression less pronounced in context of higher levels of social support ($p < .001$). Effect not found when loneliness was modelled as outcome variable.
Wright (2018)	Autistic *N* = 113	12-17yrs; 86% male; 83% White.	Longitudinal	The Child and Adolescent Social Support Scale – Parent Subscale (Malecki et al., 2000).	Cybervictimisation Questionnaire (Wright & Li, 2013); Parental Mediation of Technology Use (Arrizabalaga-Crespo et al., 2010); The Child & Adolescents Social Support Scale (Malecki et al., 2000).	Higher levels of parental mediation of technology use ($p < .01$) & perceived social support from parents ($p < .001$) (both measured at T1) protect from vulnerability to (T1) cybervictimisation & (T2) depression for autistic adolescents.
Wright & Wachs (2019)	Autistic *N* = 128	11-16yrs, *mean* age = 13.76 (*SD* = 0.86); 89% male; 86% White.	Cross-sectional	Peer rejection measured through Peer Nominations ("peers whom you like the least") (e.g., Veenstra et al., 2010; Bellmore et al., 2010; Calvete et al., 2010; DeRosier et al., 2009).	Cybervictimisation Questionnaire (Wright & Li, 2013).	Interaction between cyberbullying victimisation & peer rejection for depression ($p < .01$): High levels of peer rejection strengthened relationship between cyberbullying victimisation & depression ($p < .05$).
Yen et al., (2014)	ADHD *N* = 251	11-18yrs, *mean* age = 13.1 (*SD* = 2.0); 100% male, ethnicity not reported.	Cross-sectional	Peer domain of Taiwanese Quality of Life Questionnaire for Adolescents (Fuh et al., 2005).	Cyberbullying Experiences Questionnaire; Chen Internet Addiction Scale (Chen et al., 2003).	Satisfaction with peer relationships did not increase the significance of the models predicting correlates of cyberbullying victimisation (*Wald* = 0.737, *OR* = 1.033, *CI* = 0.959-1.113) or correlates of cyberbullying perpetrators (*Wald* = 0.028, *OR* = 0.993, *CI* = 0.909-1.084) in the previous year for male ADHD adolescents.

Note. SM = social media, CMC = computer mediated communication, SIEC = social integration and emotional connectedness, SNS = social networking site, CI = confidence interval.

Summary of Findings

See Table 1 for a summary of the main findings.

Autism

Of the 11 studies examining social media use and social connectedness in autism, six reported a positive association between social media use and social connectedness (five within-participants designs, one between-participants design). Two between-participants studies found mixed results. One between-participants study supported a negative association (i.e., social media and social *dis*-connectedness), and two found no significant association (one within-participants design, one between-participants design).

Of the five studies that supported an association between social media use and social connectedness in within-participants designs, Kuo and colleagues (2014) found that autistic adolescents who used SNS reported greater security in their friendships than those who did not use SNS (p = .039), although the use of a custom tool to measure social media use suggests caution when interpreting these findings.

In Wright's (2017) study, a significant interaction between cyber victimisation and social support indicated that the relationship between cybervictimisation and depression was diminished in the context of high levels of social support (B = 0.17, SE = 0.08, p < .001).

Longitudinal analyses (T1 and T2 separated by one year) (Wright, 2018) found that perceived social support from parents (B = 0.15, SE = 0.07, p < .001) (measured at T1) moderated the association between cyber victimisation (at T1) and depression (at T2), with greater social support diminishing the association. In a different cross-sectional study, Wright and Wachs (2019) found that higher levels of peer rejection strengthened an association between cyberbullying victimization and

depression (β = 0.20, *SE* = 0.07, $p < .05$). Taken together, these findings were interpreted as social support offering a protective buffer against negative online experiences. The confidence in the authors' interpretation is strengthened by the use of established and validated tools of social media and social connectedness and the longitudinal design (Wright, 2018).

Mazurek (2013) found that a statistically greater percentage of autistic individuals who used SNS had a best friend (66.3%) than those who did not use SNS (33.3%) ($\chi^2 = 7.62$, $p = .006$). However, SNS use alone did not significantly predict loneliness ($\beta = 0.07$, $p = .49$).

A positive association between social media use and social connectedness was also found using a between-participant design by van Schalkwyk and colleagues (2017). Parents' ratings of their child's social media use were correlated with better friendship quality ($r = 0.36$, $p < .05$), with 24% of the variance in friendship quality explained by social media engagement ($F = 3.7$, $p < .05$). This association was not seen in non-autistic adolescents. Further, anxiety levels moderated the relationship: social media use was associated with better friendship quality ($\beta = 0.61$, $p < .05$) only for autistic adolescents with low anxiety levels. Despite this interesting finding, the use of a cross-sectional design precludes causal inference in the relationship between the use of social media and friendship quality.

With respect to the two between-participant studies that had mixed findings, Gillespie-Lynch and colleagues (2014) found that CMC benefitted autistic adults more than non-autistic adults in making and maintaining contact with similar others ($p < .001$). However, autistic adults used the internet to stay close to family and friends less than non-autistic participants ($p < .001$), which was interpreted as indicative of social media fostering weaker social ties for autistic users.

Van der Aa and colleagues (2016) found that autistic individuals reported having made more acquaintances online ($F = 7.80$, $p = .006$) and appreciated CMC ($F = 11.53$, $p = .01$) more than non-autistic participants. However, there was no significant interaction between scores on the Autism Spectrum Quotient (a measure of autistic traits) and use of CMC when testing predictors of satisfaction with online life: CMC use was the only significant (positive) predictor ($\beta = 0.21$, $p = .011$). The authors interpreted this positive association as working in a similar way for autistic and non-autistic CMC users. However, as the authors failed to control for possible confounding factors like age and gender – factors shown to covary with social media use and wellbeing (Booker et al., 2018; Coyne et al., 2023; Krasnova et al., 2017) – this may have introduced threats to the internal validity of the findings.

One between-participants study undertaken during the COVID-19 pandemic (Cardy et al., 2021) found a negative association (i.e., a link between social media use and increased social *dis*connectedness). Parents perceived their autistic child *lost* significantly more time with (offline) social interactions as a negative consequence of screen time compared to parents of non-autistic children ($p < .001$). Despite an interesting finding, the use of parent-reported data brings into question the validity of the claims and potential reporting bias as to whether parents and caregivers accurately represent their child's experience.

Two studies found no association between social media use and social connectedness. Using a within-participants design, Holfeld and colleagues' (2019) found that perceived social support was not significantly correlated with technology use ($r = 0.04$; $r = 0.07$).

Considering the study using a between-participants design, Alhujaili and colleagues (2022) found a statistically significant difference in the purposes of social

media use (p = .008). Non-autistic social media users reported using social media more for social purposes relative to autistic users (92.3% compared to 7.7%), whilst autistic social media users reported using social media more for entertainment (59.1% compared to 40.9%). Although a notable finding, the small sample size and reliance on a convenience sampling method limits the generalisability of the results and suggests that the authors' claims should be taken with caution.

Attention Deficit Hyperactivity Disorder

Of the eight studies examining social media use and social connectedness in ADHD, four reported a negative association between social media use and social connectedness (i.e., social *dis*-connectedness) (one within-participants designs, three between-participants design). Two between-participant studies supported a positive association between social media use and social connectedness, and two studies found no significant association (one within-participants design, one between-participants design).

Considering the within-participants study that found a link between social media use and social *disconnectedness* first, Dawson and colleagues (2019) examined ADHD users' Facebook profiles. Facebook friends made more relationally aggressive posts towards ADHD individuals than ADHD individuals made to their friends (p = .002). ADHD participants themselves made fewer supportive posts for their friends than was reciprocated (p = .002). The authors concluded that Facebook was associated with weak online connectedness for ADHD users. However, it is important to acknowledge that methodological limitations including a cross-sectional design and use of a convenience sampling method suggests for a more cautious interpretation of the authors' conclusions.

Considering studies that included non-ADHD participants supporting the above-mentioned negative association (i.e., social *dis*-connectedness), Mikami and colleagues (2015) compared female ADHD and non-ADHD Facebook users. They found that (childhood) ADHD predicted less connectedness ($F = 6.61$, $p = .011$) and less support ($F = 4.61$, $p = .034$) from Facebook friends' posts in comparison to non-ADHD users. Despite this, these participants preferred online over face-to-face communication compared to non-ADHD participants ($F = 4.27$, $p = .040$), with *offline* peer difficulties mediating this effect ($B = 0.15$, $SE = 0.06$, $CI = 0.07\text{-}0.30$). The authors suggested that ADHD women experience poorer quality of online friendships. The study's rigorous longitudinal design and use of validated measurement tools strengthen the confidence in these findings.

In Heiman and colleagues' study (2015), ADHD cybervictims and ADHD cyberbullying witnesses reported higher levels of loneliness and lower levels of social self-efficacy when compared to non-ADHD participants (all p values $< .05$). Being ADHD, experience of cybervictimisation, and lower levels of social support were all associated with higher levels of loneliness ($F = 20.27$, $p < .001$). Although the use of established and validated measures strengthens the reliability of the conclusions linking ADHD, cybervictimisation, and loneliness, the cross-sectional design limits the ability to draw causal relationships between these variables.

Gorucu and colleagues (2020) compared ADHD and non-ADHD youths on cyberbullying/victimisation experiences, and online cognitions (i.e., thoughts and feelings about the internet). Among the subset of participants with no history of cyberbullying or victimisation, ADHD individuals scored higher on the loneliness subscale ($p = .032$; $p = .007$) than non-ADHD individuals. ADHD participants who had never been cyberbullying victims also scored higher on the online social comfort

subscale (a measure of perceived ease and authenticity in digital interactions compared to face-to-face) (p = .012) compared to non-ADHD individuals in this sub-group. Whilst the authors interpreted this as ADHD adolescents displaying problematic online cognition, higher scores on the loneliness and social comfort subscales indicate a preference for and safety in online relationships.

Considering the two between-participants studies finding a positive association between social media use and social connectedness. Lin and colleagues (2024), using multistage stratified sampling which enhances the representativeness and generalisability of the findings, reported that measures of (offline) social support were associated with lower risks of cybervictimisation (campus support: *adjusted OR* = 0.95, *CI* = 0.93, 0.96; family monitoring: *adjusted OR* = 0.98, *CI* = 0.96, 0.99). However, this did not interact with ADHD.

Marsh and colleagues (2022) found that for adolescents with greater (parent-reported) emotional connectedness to their social media use, greater cybervictimisation was associated with higher levels of (parent-reported) child anxiety (t = 3.22, p = .001) and depression (t = 5.67, p < .001). However, this effect did not differ between ADHD and non-ADHD adolescents (all *p's* > .05). Although a positive association between social media use and social connectedness was found for these two studies (Lin et al., 2024; Marsh et al., 2022), there was no difference found between ADHD individuals and neurotypicals, suggesting that the association is not specific to ADHD.

Two studies found no association between social media use and social connectedness. With respect to the study using a within-participants design first, Yen and colleagues (2014) explored factors associated with cyberbullying in male ADHD adolescents. Satisfaction with peer relationships did not have a meaningful impact

(i.e., no significant effect) on the odds of being involved in cyberbullying perpetration (*OR* = 0.993, *CI* = 0.909, 1.084) or cyberbullying victimisation (*OR* = 1.033, *CI* = 0.959, 1.113) experiences in the previous year. However, the use of convenience sampling and recruitment from mental health clinics may have introduced bias, as help-seeking participants may not be representative of ADHD adolescents not experiencing significant distress or not engaged with clinical services, thereby limiting the generalisability of the findings.

In the between-participants study by Tuncturk and colleagues (2023), non-ADHD participants were included but not compared to those with ADHD. Instead, post-hoc analyses compared ADHD participants with problematic internet use (PIU) to those with internet gaming disorder (IGD). The IGD reported higher levels of loneliness (*M* = 17.6, *SD* = 6.7) than the PIU group (*M* = 8.2, *SD* = 1.0) ($p < .001$), suggesting that ADHD individuals with PIU may face fewer threats to social connectedness than those with IGD.

Quality Analysis

See Table 2 for a summary of the quality scores of each study included. The quality scores ranged from 72.73% to 100%.

Studies lost points on the quality assessment principally for the following reasons: method of subject selection (*N* = 7, 36.84%), lack of well-defined measures (*N* = 10, 52.63%), sample size (*N* = 4, 21.05%), and for not controlling for potential confounds (*N* = 13, 68.42%). Regarding the extra custom-written quality items included, three (15.79%) studies failed to include a measure of effect size for main outcomes, seven studies (36.84%) lost points for invalid or unreliable measures of social connectedness/disconnectedness, and nine studies (47.37%) lost points for invalid or unreliable measures of social media.

See Appendix 4 for further detail in relation to specific studies and their scores on each quality index item.

Table 2

Summary of Quality Assessment

Study	Quality Score (%)	Effect Size Reported	Measurement Reliability & Validity (/2)
Alhujaili et al., (2022)	72.73	No	0
Cardy et al., (2021)	95.45	Yes	0
Dawson et al., (2019)	81.82	Yes	1
Gillespie-Lynch et al., (2014)	86.36	Yes	0
Gorucu et al., (2020)	86.36	No	2
Heiman et al., (2015)	95.45	Yes	2
Holfeld et al., (2019)	81.82	Yes	1
Kuo et al., (2014)	90.91	No	1
Lin et al., (2024)	95.45	Yes	0
Marsh et al., (2022)	95.45	Yes	2
Mazurek (2013)	90.91	Yes	1
Mikami et al., (2015)	100	Yes	2
Tuncturk et al., (2023)	86.36	Yes	2
van der Aa et al., (2016)	81.82	Yes	1
van Schalkwyk et al., (2017)	86.36	Yes	1
Wright (2017)	95.45	Yes	2
Wright (2018)	95.45	Yes	2
Wright & Wachs (2019)	90.91	Yes	1
Yen et al., (2014)	90.91	Yes	1

Discussion

This systematic review sought to explore links between social connectedness/disconnectedness and social media use in autism and ADHD within empirical research, with a view to exploring commonalities and differences between the two groups. A total of 19 eligible studies published between 2013 and 2024 were included. Despite mixed findings, i.e., data consistent with both protective and harmful effects of social media use in both groups (assuming a particular direction of causality – though more on this later), the findings were broadly supportive of opportunities for increased social connectedness for autistic individuals, but threats of social disconnectedness for ADHD individuals. However, due to the predominance of cross-sectional designs across both the autism and ADHD literature included, these conclusions remain tentative.

The research examined various aspects of social media use, from frequency to online behaviours, and documented a range of measures linked to social connectedness/disconnectedness, from friendship quality to loneliness. It is important to acknowledge that many of the included studies were limited by a lack of well-established measures and heterogenous conceptualisations of social media and social connectedness/disconnectedness, making it a challenge to compare the experiences of social connectedness/disconnectedness for autistic and ADHD social media users. Findings were mixed across both autistic and ADHD users, showing positive, negative, and no association between social connectedness and social media. Despite some differences between the autism and ADHD literature (discussed below), there were some commonalities. For example, social media was linked to high-quality friendships for autistic users, and a stronger preference for online relationships among ADHD users. Where social media was linked to social

disconnectedness, both autistic and ADHD users showed weaker online ties compared to neurotypicals. In some cases, no significant link between social media and social connectedness was found for either group.

To the author's knowledge, this review is the first to examine the links between social media use and social connectedness in autism and ADHD together. The findings are generally consistent with existing systematic reviews suggesting social media supports social connectedness for autistic individuals (Hudson et al., 2023; Hassrick et al., 2021), whilst recognising it may not fully alleviate loneliness or replace in-person relationships (Hassrick et al., 2021). The findings also reflect a narrative review of problematic social media use in ADHD adolescents, that suggests that whilst ADHD adolescents may seek online connectedness to compensate for offline peer challenges, they (often) encounter difficulties online that mirror their offline peer experiences (Dekkers & van Hoorn, 2022).

We can speculate as to why there may be differences found between autistic and ADHD social media users' experiences of social connectedness. With respect to finding more reports of social *connectedness* for autistic users, the affordances of online communication may be particularly relevant for (some) autistic individuals with respect to core features of autism and differences in social processes (Ferguson et al., 2024). Delays in communication may allow for more time to respond, fewer non-verbal cues may reduce the risk of sensory overload, and social metrics such as 'likes' and 'shares' may reduce uncertainty in relation to social status (Nesi et al., 2018; Ferguson et al., 2024; Hassrick et al., 2021; Gillespie-Smith et al., 2021). Therefore, autistic users have the potential to gain more *online*, relative to the possible difficulties associated with offline social interactions (Hassrick et al., 2021).

The online world may support social connectedness for autistic individuals by enabling interaction around shared interests via forums and group discussions (Burke et al., 2010). Indeed, a core feature of autism is what is sometimes (arguably unhelpfully) called ‘restrictive and repetitive behaviours’ (APA, 2013), which in practice often includes passionate interests that can be rewarding (Long et al., 2025; Grove et al., 2018; Grove et al., 2016). In a qualitative study, autistic adult users reported using social media to connect over common interests (van Driel et al., 2023). This may explain the differences found between autistic and ADHD individuals. However, it is also worth noting that affordances of social media (e.g., seemingly disordered algorithms, unclear online social norms) can also bring challenges to some autistic users (van Driel et al., 2023).

In contrast to autistic users, the features and affordances of the online world may be particularly challenging for ADHD users. Online platforms include a variety of stimuli (e.g., notifications, ads) designed to maximise attentional capture (Tibber & Silver, 2022). Given that core features of ADHD include differences in sensitivity to environmental stimuli and attentional control, these affordances may increase distractibility and feelings of overwhelm (Ginapp et al., 2023; Dekkers & van Hoorn, 2022). This speaks to a recent qualitative study of young adult ADHD users (Ginapp et al., 2023): despite online ADHD communities providing a sense of belonging, the affordances of social media (e.g., content overload) were highlighted as a barrier to online socialising.

Increased levels of impulsivity in (some) ADHD individuals could also link with negative online experiences (Dekkers & van Hoorn, 2022). ADHD users may respond more quickly online, which might lead to misunderstandings, possible conflict, or engagement in online risk-behaviours (Dekkers & van Hoorn, 2022).

Additionally, the ‘online disinhibition effect’ (i.e., where people feel less restrained in online interactions due to factors like anonymity; Suler, 2004), could exacerbate impulsive behaviours in ADHD individuals (Dekkers & van Hoorn, 2022). These core features of ADHD could partly account for the differences in the findings.

Age differences may also explain the differences found between ADHD and autistic users. ADHD participants were younger (*M* = 15.01) than the autistic participants (*M* = 21.79) in the research reviewed. Orben and colleagues (2022) highlighted windows of developmental sensitivity to negative effects of social media, with adolescents (14-15 for males, 11-13 for females) being particularly vulnerable. Thus, ADHD participants more clearly fell into this sensitive window, increasing the potential for harmful effects relative to autistic users.

Alternatively, the relative differences found between autistic and ADHD users’ experiences of social connectedness might be explained by the lenses and pre-conceived notions brought to the research. The wider literature on social connectedness has been criticised for lacking conceptual clarity (Barber & Schluterman, 2008; Allen et al., 2021; Nicholson, 2009), and the studies included in this review were heterogenous in their operationalisation of social connectedness, making it challenging to make comparisons across studies. In general, however, the studies on *autistic* users more frequently examined the potential for social *connectedness* (e.g., appreciation of social media, friendship quality). In contrast, the studies on *ADHD* users more often explored ‘threats’ to social connectedness and ‘problematic’ patterns of social media (e.g., problematic use, cyberbullying). These differences in conceptual framing could have shaped the observed outcomes.

Such explanations risk overlooking how online and offline environments, platform design, and cultural norms and context shape these experiences. They also

replicate deficit-based assumptions that have historically characterised both ADHD and autism research. The result is a tendency to locate the cause of disconnection within the neurodivergent person, rather than in the interaction between the person and the structures, biases, and affordances of the wider environment. Without attending to these dynamics, research risks perpetuating the very marginalisation it seeks to understand.

The cultural context of the studies may in part have influenced their findings when considering the experiences of social media, social connection, and neurodivergence more widely. Whilst some effects of social media may be universal, motivations for social media use, online behaviours, and the interaction with social connectedness may vary across cultures (Lee et al., 2014; Ndasauka & Ndasauka, 2024; Marshall et al., 2023). For example, ‘collectivist’ cultures may be more motivated by a sense of belongingness and community norms, whilst ‘individualistic’ societies – although still motivated by social connection – may be more motivated by self-expression and self-presentation online (Ndasauka & Ndasauka, 2024), which could both interact with the user experience. The studies included in this review were predominantly from Western cultures, particularly for the autism literature, which could reflect a context that is largely individualistic and digitally saturated. Therefore, such settings may offer autistic individual’s unique opportunities for identity expression and online community to support connectedness, which could explain some of the observed differences between the autism and ADHD literature. More generally, platform access and digital infrastructure vary across countries, meaning that the features and affordances available on different platforms and enabling social connection may vary. This could impact on the user experience. Given the lack of

direct examination of cultural moderators in much of the literature, these interpretations remain necessarily speculative and call for further investigation.

Quality of Reviewed Literature

It is not possible to give a banded rating of literature quality as Kmet et al., (2004) did not provide standardised cut-offs for their quality assessment tool. Nevertheless, all studies included scored above 72.73%, suggesting a relatively high quality of included studies.

With respect to weaknesses of the literature, seven of the 19 studies lost points on the method of participant selection. Online recruitment may have introduced biases related to factors such as socioeconomic status and motivations for engagement (Blumenberg et al., 2019). Recruiting from clinics might introduce bias due to disparities in access to services and diagnostic outcomes for neurodivergent individuals, including parental education, gender, and ethnicity (Kelly et al., 2019; Hosozawa et al., 2020; Kandeh et al., 2020; Loomes et al., 2017; Duvekot et al., 2017; Lundström et al., 2019; Martin et al., 2024). These methods may limit the generalisability of the findings.

Thirteen studies lost points for not controlling for confounding variables. Thus, for this systematic review it was decided *a priori* that studies should control for age and gender, as these factors have been shown to covary with social media use and wellbeing (Booker et al., 2018; Coyne et al., 2023; Krasnova et al., 2017). Failing to control for these factors may have compromised internal validity and introduced biases in the observed effects (Wilms et al., 2021; Zinbarg et al., 2010).

Ten studies lost points due to poorly defined measures on the quality assessment tool. This trend was captured by the additional custom quality measure items: nine studies lacked a valid and reliable measure of social media (47.37%),

and seven studies (36.84%) lacked a valid and reliable measure of social connectedness. This brings into question the validity of the findings regarding whether the constructs are being measured accurately, which speaks to wider criticisms in the field of social media research surrounding poorly operationalised constructs and validated measures (Kross et al., 2021; C. C. Yang et al., 2021).

Other limitations include the cross-sectional nature of the majority of research designs (84.21%), meaning that causality and underlying directions thereof cannot be inferred. For example, it cannot be determined if using social media increases social connectedness/disconnectedness for autistic and ADHD users, or if autistic/ADHD individuals who experience social connectedness/disconnectedness more use social media differently (or indeed, whether associations are bidirectional). Therefore, the conclusions should be interpreted with caution.

The relative underrepresentation of non-WEIRD (White, Educated, Industrialised, Rich, and Democratic) individuals (Henrich et al., 2010) is another limitation of the included literature, and reflects a wider issue of disparities with delays in assessment and diagnoses of neurodevelopmental conditions amongst minoritised groups (Mandell et al., 2007; Kandeh et al., 2020; Aylward et al., 2021; Shi et al., 2021). Research biased in this way risks exacerbating such existing inequalities in diagnosis and support.

Overall, the limitations in the quality of the literature as outlined above suggest that some caution should be taken regarding the generalisability of the findings.

Limitations of the Review

This review excluded studies of gaming. This was intentional and decided *a priori,* since the core interest of the thesis was on the extent to which *social* media is socially connecting. Whilst gaming can support social ties (Colder-Carras et al.,

2017; Gonçalves et al., 2023), it is often used for solitary entertainment (Vella et al., 2016) and may occur offline. Although there are overlapping affordances (Nesi et al., 2018), social media's core functionality was designed for social interaction. However, this may have limited the findings, particularly for neurodivergent communities who may find meaningful connectedness through online gaming communities (whilst also experiencing associated challenges) (Harrison et al., 2024).

This review aimed to explore commonalities and differences in the autism and ADHD literature, though these conditions often co-occur due to shared characteristics (Hollingdale et al., 2020). Six ADHD studies excluded autistic participants, whereas three autism studies included some participants with co-occurring ADHD, as it was not an exclusion criterion. None of the studies directly compared autistic and ADHD participants within the same study, making it difficult to determine whether observed differences reflect genuine group distinctions, or methodological variability.

The exclusion of grey literature and non-English language publications may have introduced biases with respect to overrepresentation of positive findings (Stern & Kleijnen, 2020; Paez, 2017). As peer-review journals may be subject to time-lags (Paez, 2017), the inclusion of grey literature may have enhanced the understanding of the findings, particularly in the context of the rapidly evolving field of social media.

Implications

Given the widespread use of social media, it is crucial to understand how to maximise its benefits and minimise its harms. This review identifies social connectedness – and the fulfilment of core needs for acceptance and belonging – as a key target for social media intervention (Clark et al., 2017; Tibber & Silver, 2022). This focus may be especially important for neurodivergent individuals, who often

face elevated risks of stigma, social exclusion, and threats to belonging (Accardo et al., 2024; Hellström, 2019; Mazumder & Thompson-Hodgetts, 2019; Menezes et al., 2025; Masuch et al., 2019; Lebowitz, 2016).

The findings support the idea that exploring an individual's engagement with social media should be integrated into clinical assessments (Tibber & Silver, 2022). Further, the findings underscore the importance of considering individual differences in the relationship between social media and wellbeing (Beyens et al., 2020; 2021), particularly core features of autism and ADHD, as these may influence how individuals experience online platforms and online social connectedness. Clinicians could explore how an individual's core features interact with social media use and social connectedness during clinical assessment to support a more nuanced formulation of distress.

Future Research

This review suggests that social media may be associated with varying levels of social connectedness for autistic and ADHD users. However, experimental and longitudinal research is needed to test for causal relationships as well as underlying directions thereof.

The findings (if not reflecting methodological biases), suggest that future research should explore how to harness the connecting benefits and minimise the harms of social media for neurodivergent users that may be linked to core features of autism/ADHD. For example, ADHD-related impulsivity and hyperactivity may interact with platform features (Dekkers & van Hoorn, 2022; Boer et al., 2020; Augner et al., 2023). Addressing these through control over such features (e.g., disabling notifications or autoplay), as well as psychological interventions to reduce impulsive

engagement (e.g., pausing and reflecting before posting), may help to mitigate harms for ADHD users.

More broadly, the field would benefit from moving beyond problem-saturated narratives (e.g., narrowly focusing on links between traits and 'problematic' use), and towards a strengths-based approach to interventions. This is in line with the findings of a recent study exploring the priorities for social media/mental health research in autistic adults (Tibber et al., in preparation).

Future research should focus on developing valid, reliable tools for measuring social media engagement and online social connectedness, and adhere to clear conceptual frameworks on social media and psychological constructs explored (see C. C. Yang et al., 2021 for example). A failure to do so will lead to perpetuation of the 'jingle-jangle' problem that has plagued the field (Kross et al., 2021).

Conclusions

The findings of this systematic review support a potential association between social media use and social connectedness for autistic individuals, and social media use and social disconnectedness for people with ADHD, although the findings should be interpreted with caution, particularly in the context of a predominance of cross-sectional research, and potential biases in lenses adopted with these fields. The findings and proposed recommendations for future research may support the development and co-production of both public health recommendations and social media interventions, with the objective of promoting positive patterns of social media engagement for autistic and ADHD individuals.

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Part Two: Empirical Paper

Exploring the potential benefits of social media in an autistic adult population: The association between online social connectedness, online masking, and self-esteem

Abstract

Introduction: Social media's relationship to mental health outcomes remains unclear, particularly for autistic adult users. The extent to which autistic adult social media users experience harms vs. benefits to their self-esteem may relate to levels of online social connectedness and how they present themselves online (i.e., online masking). This study explores relationships between online social connectedness, online masking, and self-esteem in autistic adult social media users.

Methods: Autistic adult social media users (N = 274) completed an online questionnaire covering demographics, social media use, (online) social connectedness, (online) masking, and self-esteem. Participants were recruited online, via word-of-mouth, and through autism charities. Regression analyses were used to explore associations between online social connectedness, online masking, and self-esteem, whilst controlling for covariates.

Results: Online social connectedness was positively associated with self-esteem (p < .001), though this did not survive after inclusion of all covariates (p = .055). Online masking was consistently negatively associated with self-esteem and survived after inclusion of any covariates (all p values < .05). Whilst no overall interaction was found in the main analyses, a significant positive interaction emerged amongst passive users (p = .007), suggesting online social connectedness may buffer against the negative impact of online masking on self-esteem in this group.

Discussion: The findings suggest that how autistic adults use social media – particularly in terms of social connectedness and masking – relates to self-esteem. The negative impact of online masking on self-esteem highlights the need to integrate social media use into clinical contexts. Future research should further explore the active/passive distinction, platform affordances and use patterns, and

factors influencing online masking. Longitudinal research is needed to identify underlying directions of causality.

Introduction

Social Media and Social Connectedness

Given social media's vast reach and daily presence in people's lives, understanding social media's complex relationship with mental health outcomes is essential. Whilst social media use has been linked to both positive and negative mental health outcomes (Akram & Kumar, 2017; Zsila & Reyes, 2023), this relationship is complex and multifaceted (Orben et al., 2019; Keles et al., 2019).

The Interpersonal-Connections-Behaviour-Framework (ICBF; Clark et al., 2017; Tibber & Silver, 2022) may be a helpful lens through which to understand the discrepancies in the literature. The ICBF posits that social media is harmful or beneficial to the extent that it supports the satisfaction of an individual's need for acceptance and belonging. In the offline context, it is well understood that an individual's social connectedness – the experience of being close, accepted, and belonging to others – is related to wellbeing (Yang et al., 2021; Lee & Robbins, 1995). When considering the online context, cross-sectional research provides support for the ICBF, demonstrating that using social media in a way to foster social connectedness is associated with improved mental health outcomes (Frost & Rickwood, 2017; Erfani & Abedin, 2018; Orben, 2020; Williams, 2019; Verduyn et al., 2017). Conversely, when used in socially disconnecting ways (e.g., social comparisons), social media is associated with worse mental health outcomes (Verduyn et al., 2017; Tibber et al., 2020), including lower self-esteem (Tibber et al., 2020).

Social Media, Social Connectedness, and Self-Esteem

Self-esteem refers to an individual's subjective evaluation of themselves in terms of their qualities, abilities, and self-worth (Donnellan et al., 2015). Longitudinal

research has established that low self-esteem is linked to poorer mental health outcomes (Steiger et al., 2014; Orth et al., 2009), whilst high self-esteem is associated with more positive outcomes (Henriksen et al., 2017). As a recent meta-analysis has robustly related self-esteem to life outcomes, including in education, work, and social relationships (Orth & Robbins, 2022), it is important to understand in which contexts self-esteem may be enhanced or hindered, as this may support clinical practice.

Online social processes have been associated with self-esteem in cross-sectional research. For example, in emerging adult social media users, lower levels of self-esteem were linked to socially disconnecting patterns of use, like upward social comparisons (Tibber et al., 2020). This finding has been supported in other cross-sectional studies (Eraslan-Capan, 2015; Vogel et al., 2015), including an experimental study that demonstrated an association between problematic uses of social media (e.g., social comparisons) and lower self-esteem (Ozimek & Bierhoff, 2020). Social media's affordances, such as the number of 'likes', fear of missing out, and the promotion of curated beauty standards, may also negatively impact self-esteem through social comparisons (Kim & Kim, 2023). These findings provide tentative support for the ICBF when considering disconnecting patterns of social media use and self-esteem.

Exploring these links in autistic[5] users – where research is more limited – would be especially valuable, given that harms and benefits of social media have been established for autistic users (Hassrick et al., 2021; Page et al., 2022). Further, as autistic individuals may unfairly experience stigma, exclusion, and discrimination

[5] The current paper uses identity-first language as opposed to person-first language, as is currently preferred by the majority of the autistic community in the UK (Kenny et al., 2016; Bottema-Beutel et al., 2021).

offline (Sasson et al., 2017; Elmose, 2019), the online world may offer an opportunity for social connectedness.

Autism, Social Media, and Social Connectedness

Research has shown promising links between social connectedness and social media use for autistic individuals (Van Schalkwyk et al., 2017; Mazurek, 2013; Ward et al., 2018). A cross-sectional study found that autistic adult social media users reported having more close friends and friendships of greater quality compared to those not using social media (Mazurek, 2013). Autistic adult social media users in a qualitative study reported that their key motivations for using social media included staying connected with current relationships and forming new social connections (Wang et al., 2020). Recent quantitative and qualitative systematic reviews support these findings, highlighting that autistic users value opportunities to meet similar others through social media (Hudson et al., 2023; Kelly et al., 2022). The features and affordances of online communication (e.g., increased time to respond, reduced non-verbal cues; Nesi et al., 2018; Burke et al., 2010; Ferguson et al., 2024) may be particularly relevant for (some) autistic users to cultivate social connectedness.

Despite the potential for social media to cultivate social connectedness for autistic individuals, harms may also be experienced (Page et al., 2022; Skafle et al., 2024). For example, autistic adults in a qualitative study highlighted that whilst the online autism community helped to reduce loneliness, debates and perceived aggressive tones often hindered a sense of community (Skafle et al., 2024). A systematic review found that information and communication technology use by autistic individuals offered benefits (e.g., increased happiness), whilst also presenting threats to connectedness, like cyberbullying and trolling (Hassrick et al.,

2021). Taken together, there may be both benefits and risks to autistic social media users, which could relate to self-esteem.

Autism and Self-Esteem

Though limited, existing research suggests a potentially meaningful association between social media use, social connectedness, and self-esteem in autistic individuals. A cross-sectional study found that, for autistic adults, self-esteem was positively associated with belonging to an online community, and negatively associated with feeling ignored on social media, which generated feelings of worthlessness (Triantafyllopoulou et al., 2022). Autistic interviewees in a qualitative study described the online world as supporting positive autistic identities, which was linked to more positive self-image, self-esteem, and reduced loneliness (Skafle et al., 2024). Taken together, the literature provides tentative support for the ICBF in the context of autistic social media users, socially connecting/disconnecting patterns of use, and self-esteem, although further research is warranted. Moreover, social media's relative benefits and harms for autistic users may relate to specific constructs, such as masking.

Autism and Masking

Masking[6] – suppressing, controlling, and adjusting behaviours to appear neurotypical – is thought to stem from autism-related stigma, trauma, and invalidation (Perry et al., 2022; Pearson & Rose, 2021). Autistic masking has been linked to poor mental health outcomes, including depression, suicidality, stress, and self-esteem (Cook et al., 2021; Hull et al., 2021; Hull et al., 2017; Cage & Troxell-Whitman, 2020). Quantitative and qualitative research has pointed to a link between

[6] The current paper uses the term 'masking' in accordance with the terminology most used within the autistic community (Pearson & Rose, 2021).

masking and self-esteem, through negatively impacting self-acceptance and perceiving oneself as inauthentic (Cage & Troxell-Whitman, 2020; Hull et al., 2017; Bargiela et al., 2016; Cage et al., 2018; Cook et al., 2021; Hull et al., 2021; Evans et al., 2024). This makes it critical to understand the contexts in which masking may occur.

Masking may be related to social connectedness (Milner et al., 2022; Bradley et al., 2021; Cage et al., 2018; Evans et al., 2024). Autistic adults in a qualitative study reported feeling more comfortable showing their characteristics when they felt more connected to others (Hull et al., 2017). On the other hand, a quantitative cross-sectional study found that feelings of loneliness were associated with masking in autistic young adults (Milner et al., 2022). Therefore, meaningful social connectedness for autistic individuals may reduce masking in the offline context, although the cross-sectional nature of the research means that directions of causality are unclear.

In the online context, online self-presentation has been found to relate to social connectedness and subsequent wellbeing outcomes in neurotypicals (Yang & Bradford-Brown, 2016). For example, the need to belong was positively associated with authentic self-presentation online in adolescent social media users (Wang et al., 2018). A narrative synthesis found that inauthentic self-presentation on Facebook was linked to lower self-esteem, whilst authentic self-presentation was associated with higher self-esteem and greater perceived social support (Twomey & O'Reilly, 2017).

Although online masking research is limited, preliminary research suggests a relationship between online masking, social connectedness, and mental health outcomes. For example, a recent mixed-methods study of autistic adolescent social

media users found that participants masked significantly less online than they did offline (Jedrzejewska & Dewey, 2022). Importantly, participants highlighted that feeling socially connected reduces the need to mask. A qualitative study of late diagnosed autistic women reported that the online world removes anxieties around in-person autism presentation (e.g., body language, tone, expressions), which was linked to higher quality online social connectedness (Bargiela et al., 2016). In the offline context, higher pride in autism identity – which has been linked to masking (Cage & Troxell-Whitman, 2020; Hull et al., 2017) – and social connectedness have been associated with higher self-esteem (Corden et al., 2021; Cooper et al., 2017; Maitland et al., 2021). Taken together, there appear to be important links between online social connectedness, online masking, and self-esteem, highlighting the potential value of exploring social media use for autistic individuals through the lens of the ICBF.

The Current Project and Aims

The current study seeks to better understand how autistic adults present themselves on social media, investigating interactions between online social connectedness and online masking, and how these link to self-esteem. By understanding these processes, we may (ultimately) be able to identify ways for this population to connect safely online to maximise the benefits of the online world.

Hypotheses

H1: Autistic adults who report higher levels of online social connectedness will report higher levels of self-esteem.

The above-mentioned literature finds associations between socially connecting uses of social media and more positive mental health outcomes (Frost & Rickwood, 2017; Erfani & Abedin, 2018; Orben, 2020; Williams, 2019; Verduyn et al.,

2017), and socially disconnecting uses and negative mental health outcomes, including self-esteem (Tibber et al., 2020; Eraslan-Capan, 2015; Vogel et al., 2015). Additionally, research suggests that autistic social media users may find social connection online (Van Schalkwyk et al., 2017; Gillespie-Lynch et al., 2014). Further, feelings of belonging online are positively associated with self-esteem, whilst feeling ignored on social media is negatively associated with self-esteem (Triantafyllopoulou et al., 2021). Therefore, it was expected that online social connectedness would be positively associated with self-esteem in autistic adult social media users.

H2: Autistic adults who report masking more online will report lower levels of self-esteem.

Since there is a wealth of literature that links *offline* masking and negative mental health outcomes, including poorer self-esteem (Cook et al., 2021; Hull et al., 2021; Hull et al., 2017; Cage & Troxell-Whitman, 2020; Bargiela et al., 2016; Cage et al., 2018; Evans et al., 2024), it was expected that there would be a negative association between online masking and self-esteem.

H3: There will be an interaction between the two, such that an association between higher masking and lower self-esteem (as per H2) will be reduced in those who report higher social connection.

(Online) social connectedness may act as a buffer between (online) masking and self-esteem, ameliorating the distress associated with masking. Previous research has suggested that autistic community connectedness protects against the negative effects of experiencing minority stress on mental health (Botha et al., 2020). Masking is often associated with lack of acceptance (Cage et al., 2018; Pearson & Rose, 2021), and worse mental health, whilst social connectedness is linked to feelings of acceptance, belonging, and self-esteem (Skafle et al., 2024; Hull et al.,

2017; Triantafyllopoulou et al., 2021). Thus, it is worth investigating whether online social connectedness can protect against the potentially negative impacts of online masking on self-esteem.

H4: These effects (H1-3) will survive after controlling for offline versions of these predictors (offline social connectedness; offline masking) as well as other key variables.

It has been argued that online social processes may not be specific to social media engagement per se, but serve as a proxy for more general offline processes (Tibber et al., 2020). However, the online world has the *potential* to offer an alternative context to explore social processes in autistic adult social media users, due to affordances that may be relevant for (some) autistic users in their relationship to social processes (i.e., time to respond, reduced non-verbal cues) (Ferguson et al., 2024; Nesi et al., 2018). Controlling for offline processes allows us to examine whether the online world uniquely influences the constructs of interest. Other variables controlled for include age, gender, and level of social media use, as these have been found to commonly covary with the variables of interest (Milner et al., 2022; Cook et al., 2021; Booker et al., 2018; Coyne et al., 2023; Krasnova et al., 2017; Rosenthal & Tobin, 2023).

Methods

Ethical approval was obtained from the UCL Research Ethics Committee (26671/001) (see Appendix 5 for approval letter).

Participants

Participants were recruited online via social media, and through national UK charities (Autistica and National Autistic Society), as well as offline via word-of-

mouth. Inclusion criteria for participation was as follows: 18 years of age and over, sufficient fluency in English to engage with the survey, a UK resident, to either self-identify[7] as autistic or have a formal diagnosis of autism, and a social networking site (SNS) user (defined as using at least one site, at least once per day on average)[8].

Despite variability in effect sizes reported in studies examining social media use and wellbeing outcomes (Beyens et al., 2020; Yoon et al., 2019; Marciano et al.., 2024), a medium effect size was selected based on prior relevant empirical research involving social media use, wellbeing outcomes, and autistic social media users (Ward et al., 2018; Cunningham et al., 2021; Ostic et al., 2021; Liu et al., 2016; Beyens et al.. 2020). Cohen (1988, 1992; Brydges, 2019) suggested that a medium effect size should be observable to the naked eye, which may be unrealistic given the range of research areas that use the aforementioned guidelines. Furthermore, Cohen (1988, 1992) stated that these guidelines should only be used if estimates specific to the research area of interest are unknown. Furthermore, given inconsistent prior effect size estimates, a medium effect size was selected as a conservative, justifiable estimate for the power analysis to ensure sufficient sensitivity to detect meaningful associations (Brydges, 2019).

A power analysis using G*Power3 (Faul et al., 2007) based on a medium effect size of 0.075 (with alpha set at 0.05, beta at 0.8, and eight predictors) highlighted a minimum required sample size of 209 for regression analyses. Based on recommendations by Baranger (2019), the medium effect size was halved for the

[7] The original study was designed to include formally diagnosed autistic adults only. After consultation with an expert-by-experience collaborator and members of the autistic community regarding concerns over the limitations of excluding self-identifying autistic adults, we sought to include those who self-identify as autistic to maximise representation and inclusivity. An amendment was made and accepted by the UCL Research Ethics Committee to expand the inclusion criteria to self-identifying.
[8] We used Boyd and Ellison's (2007) definition of social networking sites in this study as we wanted to ensure that participants were using social media that are inherently social/can be used for social connectedness in the study. We acknowledge that the definition of social media is varied.

power analysis of the planned regression models. The predictors included online social connectedness, online masking, offline social connectedness, offline masking, age, gender, nature of autism diagnosis, and level of social media use.

Design and Procedure

The study had a cross-sectional, within-participants design. Those interested in participation were guided to the study through a web link provided in the advertising materials. The participant information sheet, consent form, and survey (see Appendix 6) were all completed on REDCap, an online survey platform (Harris et al., 2009; Harris et al., 2019).

An information sheet was shared with participants, which outlined how their data would be used, that participation was completely voluntary, the benefits and disadvantages of taking part, and details of services should any part of the survey cause them distress. Further, they were informed that they could withdraw at any point until survey completion without consequence. After providing consent, participants completed the online survey and were invited to enter a random draw for one of eight £20 shopping vouchers. Email addresses and identifiable information were stored securely and separately from survey responses.

The survey was initially piloted with expert-by-experience (EbE) collaborators, and a focus group of three EbE autistic adult social media users were consulted for feedback on survey design and methods before recruitment began. Minor adjustments were made based on their feedback. The three EbE focus group participants were recruited via convenience sampling and were each provided with a £20 shopping voucher for their time.

Survey Items and Measures

Participants were asked to provide basic demographic information, including age, gender, ethnicity, nature of autism diagnosis (self-identifying or formally diagnosed), age of diagnosis and diagnostic service, and any mental health diagnoses.

The survey included a series of quantitative questionnaires detailed below. See Appendix 6 for the full list of items and response options for each of the described measures.

Social Connectedness Scale Revised (online and offline)

Offline social connectedness was measured using the revised Social Connectedness Scale (SCS-R) (Lee et al., 2001) (example item SCS-R: “I feel like an outsider”). The SCS-R is a 20-item self-report questionnaire to measure how individuals view their level of social connectedness on a 6-point Likert scale, ranging from strongly agree to strongly disagree. The scale is widely used and has demonstrated good reliability and validity in its original form and in other studies (original study α = 0.92, Lee et al., 2001; Capanna et al., 2013). The SCS-R has been used with autistic participants in previous research (Rice, 2022).

The SCS-R was adapted to an online version (OSCS-R) for the purpose of the study by changing the item wording to include the word “online” to assess participants’ online social connectedness (example item OSCS-R: “My online friends feel like family”).

For both measures, items were summed (separately) to create a total score, with higher scores indicating higher levels of social connectedness (online/offline). Ratings on both scales in the current study demonstrated good internal consistency (OSCS-R: α = 0.94; SCS-R: α = 0.93).

Camouflaging Autistic Traits Questionnaire (online and offline)

Offline masking was measured by the Camouflaging Autistic Traits Questionnaire (CAT-Q) (Hull et al., 2019), and online masking was measured using an adapted version of the CAT-Q (CATO-Q) used in a previous study in which the author of the CAT-Q was consulted to support the questionnaire's development (Jedrzejewska & Dewey, 2022) (example item CAT-Q: "I have developed a script to follow in social situations"; example item CATO-Q: "I feel free to be myself when I am on social media"). Both are 25-item self-report questionnaires to measure participants' use of masking behaviours (offline or on social media) on 7-point Likert scales, ranging from strongly agree to strongly disagree. The items are summed to give a total score, with higher scores indicating more masking behaviours. The CAT-Q in its original form has demonstrated good reliability (α = 0.94) and validity (Hull et al., 2019). Ratings on both scales in the current study demonstrated good internal consistency (CATO-Q: α = 0.88; CAT-Q: α = 0.91).

Rosenberg Self-Esteem Scale

Self-esteem was measured by the Rosenberg Self-Esteem Scale (RSES) (Rosenberg, 1965) (example item: "I certainly feel useless at times"). The RSES is a 10-item self-report measure of both positive and negative feelings about the self. All items are answered using a 4-point Likert scale, ranging from strongly agree to strongly disagree. The items are summed to give a total score, with higher scores indicating higher self-esteem. The scale is widely used and has acceptable reliability and validity in its original form (α = 0.77, Rosenberg, 1965) and in other studies (Torrey et al., 2000; Sinclair et al., 2010). Additionally, the scale has been widely used in previous research with autistic participants (Cooper et al., 2017; Mazurek, 2014; Hillier et al., 2018). Ratings in the current study demonstrated good internal

consistency (α = 0.88). See Appendix 7 for Cronbach's alpha and individual item scores for all measures.

Additional Items

Participants were also asked the following four (custom-written) quantitative questions to gain an understanding of their general interactions with social media: (i) How many minutes (on average) do you use social media for in a typical week day? (ii) How many minutes (on average) do you use social media for in a typical weekend day?[9] (iii) How many social media platforms do you use? (iv) On the scale of 0-10, how active are you when you are on social media, where 0 means completely passive (refers to scrolling through people's content without liking, commenting on, or interacting), and 10 means completely active (refers to liking, commenting on, sharing, and interacting with others on social media).

In addition to the quantitative questionnaires, participants were given the option at the end of the survey to provide any general experiences of using social media. Participants were also given the option to provide any further detail to their quantitative responses after each questionnaire[10].

Analyses

Due to the possibility of the online survey including responses from 'bots' (automated software programmed to complete tasks such as online surveys) guidance was followed (Lawlor et al., 2021; Lebrun et al., 2024; Storozuk et al., 2020) to exclude data (prior to analysis) for the following reasons: (i) if participants failed one of the attention checks (did not select option seven when specified to;

[9] Items (i) and (ii) were summed during the analyses and an average score was computed for average daily social media use.

[10] Following feedback from EbE focus group participants (e.g., challenges of double negatives with established questionnaires, having no 'neutral' response option), this suggestion was implemented and received positive feedback.

reported being different ages when asked twice throughout the study; provided different email addresses when asked twice throughout the study), (ii) if participants failed a logic check (incorrect response provided to the question “what is 2 + 5?”), (iii) where there were duplicated completed surveys in quick succession, (iv) where free text responses exhibited established characteristics of bot responses, e.g., lengthy answers which were attributed to being bot stock answers (Lebrun et al., 2024), (v) if qualitative responses were not in English, (vi) if email addresses and/or names were overly unusual, e.g., random character strings.

Incomplete responses (e.g., not providing consent, incomplete demographic and/or survey items) were removed prior to the main analyses. To assess whether participants with incomplete data systematically differed from those in the final analytic sample, we compared demographic variables using independent samples *t*-tests and chi-square analyses. See Appendix 8 for further details. Data were then exported into STATA (version 19; College Station, TX: StataCorp LLC) for analyses following pseudonymisation.

Outliers were checked by calculating Z-scores and removing extreme responses (defined as values exceeding three Z-scores from the mean). Three participants were flagged as outliers on the CAT-Q. The main analyses were subsequently re-run after removing these outliers. The removal of outliers did not change the significance of the results; therefore, findings from the full analytic sample are reported in the Results. See Appendix 9 for the final multivariate analyses with outliers removed.

The following assumptions of linear regression analyses were tested: normality of residuals, linearity, homoscedasticity, and multicollinearity, using histograms, scatterplots, Breusch-Pagan and Shapiro-Wilk, and inspecting the

variance inflation factor (VIF) values, respectively. Whilst all assumptions were met overall, the assumption of normality was violated for the CAT-Q when including outliers (*N* = 3). This violation appears to be due to the three extreme scores, as exclusion of these participants resulted in normality being satisfied. See Appendix 10 for details.

Pearson's correlations were conducted to assess bivariate relationships between key variables (online social connectedness, online masking, self-esteem, offline social connectedness, offline masking).

A series of univariate and multivariate linear regression analyses were used to test *a priori hypotheses* and to explore associations between predictors, interaction terms, covariates and outcome variables. Details of the specific predictors modelled in each analysis are provided in the Results section below.

Finally, *post-hoc* sensitivity analyses were run with outliers removed to determine whether findings were retained when only formally diagnosed autistic social media users were included. This is critical in the context of ongoing debate around the advantages/disadvantages of self-identification in autism research (English et al., 2024). In addition, following recommendations that emerged from the focus group, exploratory *post-hoc* analyses were run with outliers removed to determine whether active and passive social media users showed the same or different patterns of findings. Participants reflected that their mode (active/passive) of social media use could influence their responses to questions, which they felt might be a valuable addition to the survey. This suggestion was supported by existing literature that suggests active/passive use may be an important distinction in terms of assessing benefits and harms of social media (Hancock et al., 2022; Keum et al., 2022).

Results

A total of 425 participants were captured by the REDCap survey tool. After applying the exclusion criteria, reasons for removal included: six participants due to not providing consent to participate, three participants due to dropping-out following provision of consent, 22 participants for being duplicates, 29 participants as blanks (no data provided), three participants for not confirming whether they had been given a formal autism diagnosis, three participants due to responding to number of social media platforms with extreme numbers (> 30), and 31 participants for failing the 'bot-checks'. In addition, 54 participants were removed for incomplete survey responses, and compared to the full analytic sample; no significant differences were found between included and excluded participants (all *p* values > .05). See Appendix 8 for analyses and Appendix 11 information on demographics of these 54 participants.

The final analytic sample consisted of 274 participants. Where necessary, items on measures were reverse scored, and summary scores for each scale were calculated. See Appendix 12 for summary statistics.

In the full analytic sample (*N* = 274), participants ranged in age from 18 to 72 years (*M* = 39.20, *SD* = 13.28). The sample included 66 (24.09%) participants that identified as male and 170 (62.04%) that identified as female, 31 (11.31%) participants identified as nonbinary, three (1.09%) participants identified their gender as 'other', and four (1.46%) participants reported that they preferred not to say. Regarding ethnicity of the participants, 245 (89.42%) participants reported their ethnicity as White, 10 (3.65%) reported their ethnicity as Asian or Asian British, nine (3.28%) reported their ethnicity as mixed or multiple ethnic groups, eight (2.92%) as Black British, Caribbean or African, and one (0.36%) reported their ethnicity as

another ethnic group. Regarding nature of autism diagnosis, 249 (90.88%) indicated that they had a formal diagnosis of autism, and 25 (9.12%) indicated that they self-identified as autistic. For those with a formal diagnosis of autism, the age of diagnosis ranged from 1-69 years (M = 32.74, SD = 15.88). Of the analytic sample, 168 (61.31%) reported that they had a current mental health diagnosis: the most commonly reported mental health diagnoses were depression (34.31% of the full analytic sample) and anxiety (32.12% of the full analytic sample). The average number of minutes per week spent on social media ranged from 1.5 to 690 (M = 131.44, SD = 112.52). See Appendix 13 for information on participant demographics.

Correlations

Bivariate correlations indicated significant positive associations between online social connectedness and self-esteem, and significant negative associations between online masking and self-esteem. See Table 1 for correlation coefficients.

Online Social Connectedness and Self-Esteem (H1 and H4)

A univariate linear regression analysis was run, with self-esteem as the outcome variable and online social connectedness as the predictor (Group 1 Models; see Table 2). The model was significant ($F_{(1, 272)}$ = 42.84, p < .001), and accounted for 13.61% of the variance in self-esteem (R^2 = 0.14). Online social connectedness was significantly positively associated with self-esteem (B = 0.11, CI = 0.08, 0.15, p < .001), meaning that higher levels of online social connectedness are associated with higher self-esteem scores.

This analysis was then re-run with inclusion of offline social connectedness included as a covariate (Group 2 Models; see Table 2). The model was again significant ($F_{(2, 271)}$ = 72.23, p < .001) and accounted for 34.77% of the variance in self-esteem (R^2 = 0.35). In this model, online social connectedness remained

positively associated with, and predicted unique variance in, self-esteem (B = 0.04, CI = 0.00, 0.07, p = .034), i.e., higher levels of online social connectedness were associated with higher self-esteem scores even after controlling for *offline* social connectedness.

Finally, the analysis was re-run whilst controlling for offline social connectedness *and* other covariates (Group 3 Models; see Table 2). The model was significant ($F_{(7, 266)}$ = 23.04, p < .001) and accounted for 37.75% of the variance in self-esteem (R^2 = 0.38). However, online social connectedness no longer predicted a significant amount of unique variance in self-esteem (B = 0.03, CI = -0.00, 0.07, p = .055).

Online Masking and Self-Esteem (H2 and H4)

A univariate linear regression analysis was run, with self-esteem as the outcome variable and online masking as the predictor (Group 1 Models; see Table 3). The model was significant ($F_{(1, 272)}$ = 25.05, p < .001) and accounted for 8.43% of the variance in self-esteem (R^2 = 0.08). Online masking was significantly negatively associated with self-esteem (B = -0.07, CI = -0.10, -0.04, p < .001), meaning that higher levels of online masking were associated with lower self-esteem.

The analysis was then re-run with *offline* masking included as a covariate (Group 2 Models; see Table 3). The model was again significant ($F_{(2, 271)}$ = 17.98, p < .001) and accounted for 11.71% of the variance in self-esteem (R^2 = 0.12). In this analysis, online masking was significantly negatively associated with, and predicted unique variance in, self-esteem *(*B = -0.05, CI = -0.08, -0.02, p = .004), meaning that higher levels of online masking were associated with lower self-esteem, even after controlling for *offline* masking.

Finally, the analysis was re-run whilst controlling for offline masking *and* other covariates (Group 3 Models; see Table 3). The model was significant ($F_{(7, 266)} = 5.35$, $p < .001$) and accounted for 12.35% of the variance in self-esteem ($R^2 = 0.12$). In this model, online masking remained negatively associated with, and predicted unique variance in, self-esteem ($B = -0.05$, CI = -0.08, -0.01, $p = .006$), meaning that higher levels of online masking were associated with lower self-esteem scores, even after inclusion of *offline* masking and keeping other covariates constant.

Interaction Between Online Social Connectedness and Online Masking

A multivariate linear regression analysis was run, with self-esteem as the outcome variable, and the following predictors: online social connectedness, online masking, and a term representing an interaction between the two (Group 1 Models; see Table 4). The model was significant ($F_{(3, 270)} = 19.99$, $p < .001$) and accounted for 18.18% of the variance in self-esteem ($R^2 = 0.18$). However, the interaction was not significant ($B = 0.00$, CI = -0.00, 0.00, $p = .277$), nor did online social connectedness predict unique variance ($B = 0.01$, CI = -0.14, 0.17, $p = .858$). Instead, online masking emerged as the only significant (negative) predictor ($B = -0.11$, CI = -0.21, -0.01, $p = .041$).

This analysis was then re-run with *offline* social connectedness and *offline* masking included as covariates (Group 2 Models; see Table 4). The model was again significant ($F_{(5, 268)} = 32.84$, $p < .001$) and accounted for 37.99% of the variance in self-esteem ($R^2 = 0.38$). *Online* masking remained as a significant (negative) predictor *(*$B = -0.11$, CI = -0.20, -0.02, $p = .018$), and *offline* social connectedness was significantly (positively) associated with, and predicted unique variance in, self-esteem ($B = 0.17$, CI = 0.13, 0.21, $p < .001$). The interaction, *online* social connectedness, and *offline* masking were not significant (all p values > .05).

Finally, the analysis was re-run whilst controlling for *offline* variables and other key covariates (Group 3 Models; see Table 4). The model was significant ($F_{(10, 263)}$ = 17.37, p < .001) and accounted for 39.77% of the variance in self-esteem (R^2 = 0.40). *Online* masking remained significantly (negatively) associated with, and predicted unique variance in, self-esteem (B = -0.10, CI = -0.19, -0.01, p = .033), and *offline* social connectedness remained significantly (positively) associated with, and predicted unique variance in, self-esteem (B = 0.18, CI = 0.14, 0.22, p < .001). The interaction, *online* social connectedness, *offline* masking and other covariates did not reach significance (all p values > .05).

Post-Hoc Sensitivity Analyses

Formally Diagnosed. When re-running the analyses for formally diagnosed participants only (N = 246), the main findings were unaffected with one exception: when (all) covariates were included in the model, *online* social connectedness was significantly positively associated with self-esteem (B = 0.04, CI = 0.01, 0.08, p = .027) (H1 and H4), i.e., increased *online* social connectedness was associated with greater self-esteem.

Passive and Active Social Media Users. Initial analyses were undertaken to explore significant differences between key study variables for active and passive social media users. Significant differences were found for OSCS-R, CATO-Q, SCS-R, and average level of daily social media use between passive and active social media users (all p values < .05), with passive users showing lower levels of online social connectedness, lower levels of offline social connectedness, lower levels of average social media use, and higher levels of online masking (see Appendix 14 for full details).

With respect to regression analyses, when these were run for *active* social media users only (*N* = 128), the same pattern held as the main analyses, with the following exceptions. First, online social connectedness did not predict self-esteem once *offline* social connectedness was included in the analysis (*B* = 0.03, CI = -0.02, 0.09, *p* = .201) (H1 and H4). Further, online masking was not significant in the interaction model when other predictors were included (*p* = .758).

With respect to *passive* social media users, (*N* = 143), the same pattern also held as the main analyses, with a number of exceptions. First, online social connectedness no longer predicted unique variance in self-esteem once offline social connectedness was added to the model (*B* = 0.05, CI = -0.01, 0.10, *p* = .106) (H1 and H4). Second, the interaction between online social connectedness and online masking was significant when offline variables were added to the model and held when other covariates were included (final model interaction term: *B* = 0.00, CI = 0.00, 0.01, *p* = .007) (H3 and H4). This positive interaction indicated that the negative association between online masking and self-esteem was weaker for individuals who reported higher levels of online social connectedness. Online social connectedness was also significant in the interaction model but reversed in direction relative to what was predicted (*B* = -0.27, CI = -0.50, -0.04, *p* = .025). See Figure 1 for a plot of the interaction, and Appendix 15 (Tables 13-15) for post-hoc analyses.

Table 1

Pearson's Correlation Coefficients for Key Study Variables

	OSCS-R	CATO-Q	RSES	SCS-R	CAT-Q
OSCS-R	1.00	-	-	-	-
CATO-Q	**-0.25**	1.00	-	-	-
RSES	**0.37**	**-0.29**	1.00	-	-
SCS-R	**0.48**	**-0.20**	**0.58**	1.00	-
CAT-Q	**-0.19**	**0.49**	**-0.30**	**-0.42**	1.00

Note. OSCS-R = Online Social Connectedness Scale Revised, CATO-Q = Camouflaging Autistic Traits Online Questionnaire, RSES = Rosenberg Self-Esteem Scale, SCS-R = Social Connectedness Scale Revised, CAT-Q = Camouflaging Autistic Traits Questionnaire. Values in bold indicate significant predictors.

Table 2

Regression Analyses Showing the Regression of Self-Esteem on Online Social Connectedness and Other Predictors

		Univariate Analysis Group 1			Multivariate – With Offline Covariate Group 2			Multivariate – With All Covariates Group 3		
Predictor		Coefficient (95% CIs)	*SE*	*p*	Coefficient (95% CIs)	*SE*	*p*	Coefficient (95% CIs)	*SE*	*p*
Online social connectedness		0.11 (0.08, 0.15)	0.02	**< .001**	0.04 (0.00, 0.07)	0.02	**.034**	0.03 (-0.00, 0.07)	0.02	.055
Offline social connectedness		-	-	-	0.17 (0.14, 0.21)	0.02	**< .001**	0.18 (0.14, 0.22)	0.02	**< .001**
Age		-	-	-	-	-	-	0.06 (0.02, 0.10)	0.02	**.007**
Gender	Female	-	-	-	-	-	-	-0.98 (-2.24, 0.29)	0.64	.129
	All other genders	-	-	-	-	-	-	-1.81 (-3.60, -0.01)	0.91	**.049**
Level of social media use		-	-	-	-	-	-	0.00 (-0.00, 0.01)	0.00	.691
Nature of autism diagnosis	Self-identifying	-	-	-	-	-	-	0.43 (-1.41, 2.28)	0.94	.643

Note. Values in bold indicate significant predictors. Reference groups for categorical predicters were (in brackets) as follows: gender (male), nature of autism diagnosis (formally diagnosed). CI = confidence intervals, SE = standard error.

Table 3

Regression Analyses Showing the Regression of Self-Esteem on Masking and Other Predictors

Predictor		Univariate Analysis Group 1			Multivariate – With Offline Covariate Group 2			Multivariate – With All Covariates Group 3		
		Coefficient (95% CIs)	*SE*	*p*	Coefficient (95% CIs)	*SE*	*p*	Coefficient (95% CIs)	*SE*	*p*
Online masking		-0.07 (-0.10- -0.04)	0.01	**< .001**	-0.05 (-0.08- -0.02)	0.02	**.004**	-0.05 (-0.08- -0.01)	0.02	**.006**
Offline masking		-	-	-	-0.05 (-0.09- -0.02)	0.02	**.002**	-0.05 (-0.09- -0.02)	0.02	**.002**
Age		-	-	-	-	-	-	-0.00 (-0.06- 0.05)	0.03	.881
Gender	Female	-	-	-	-	-	-	-0.32 (-1.83- 1.20)	0.77	.681
	All other genders	-	-	-	-	-	-	-1.43 (-3.56- 0.70)	1.08	.188
Level of social media use		-	-	-	-	-	-	0.00 (-0.01- 0.01)	0.00	.693
Nature of autism diagnosis	Self-identifying	-	-	-	-	-	-	0.32 (-1.86- 2.50)	1.11	.773

Note. Values in bold indicate significant predictors. Reference groups for categorical predicters were (in brackets) as follows: gender (male), nature of autism diagnosis (formally diagnosed). CI = confidence intervals, SE = standard error.

Table 4

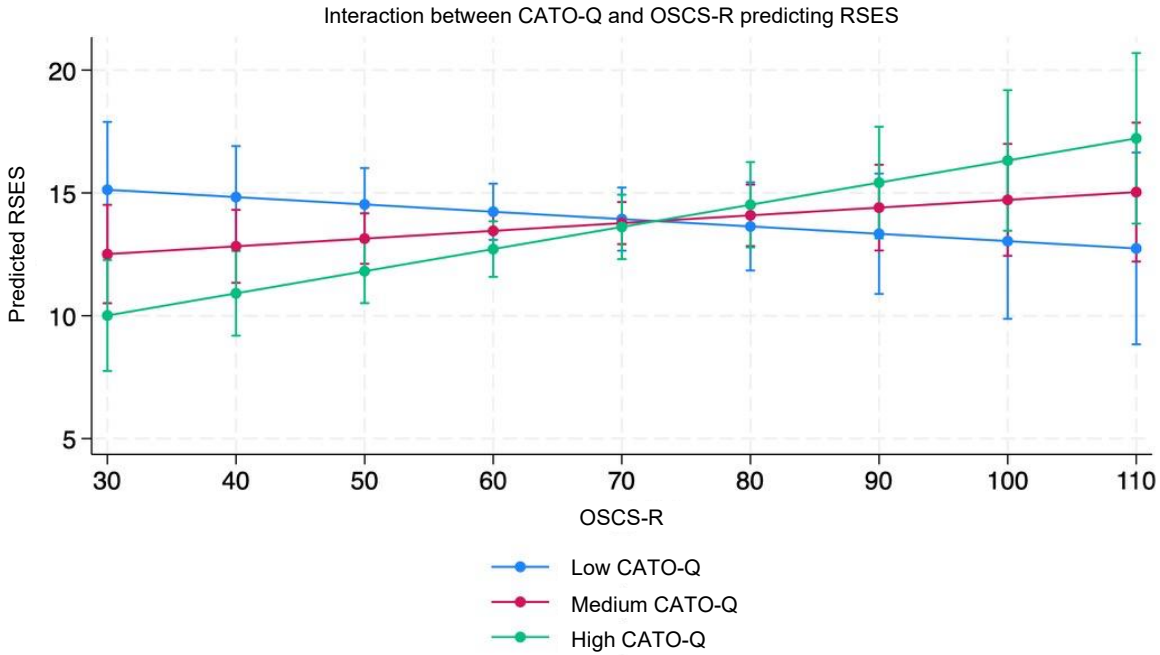
Regression Analyses Showing the Regression of Self-Esteem on Online Social Connectedness, Online Masking, the Interaction Term, and Other Predictors

Predictor		Univariate Analysis Group 1			Multivariate – With Offline Covariates Group 2			Multivariate – With All Covariates Group 3		
		Coefficient (95% CIs)	*SE*	*p*	Coefficient (95% CIs)	*SE*	*p*	Coefficient (95% CIs)	*SE*	*p*
Online social connectedness		0.01 (-0.14-0.17)	0.08	.858	-0.07 (-0.21-0.06)	0.07	.280	-0.07 (-0.21-0.07)	0.07	.301
Online masking		-0.11 (-0.21- -0.01)	0.05	**.041**	-0.11 (-0.20- -0.02)	0.05	**.018**	-0.10 (-0.19- -0.01)	0.05	**.033**
Interaction (online social connectedness*online masking)		0.00 (-0.00-0.00)	0.00	.277	0.00 (-0.00-0.00)	0.00	.136	0.00 (-0.00-0.00)	0.00	.150
Offline social connectedness		-	-	-	0.17 (0.13-0.21)	0.02	**< .001**	0.18 (0.14-0.22)	0.02	**< .001**
Offline masking		-	-	-	0.01 (-0.02-0.04)	0.02	.648	0.01 (-0.03-0.04)	0.02	.682
Age		-	-	-	-	-	-	0.04 (-0.00-0.08)	0.02	.071
Gender	Female	-	-	-	-	-	-	-0.81 (-2.07-0.46)	0.64	.209
	All other genders	-	-	-	-	-	-	-1.70 (-3.51-0.11)	0.92	.066
Level of social media use		-	-	-	-	-	-	0.00 (-0.00-0.01)	0.00	.707
Nature of autism diagnosis	Self-identifying	-	-	-	-	-	-	0.42 (-1.42-2.25)	0.93	.656

Note. Values in bold indicate significant predictors. Reference groups for categorical predicters were (in brackets) as follows: gender (male), nature of autism diagnosis (formally diagnosed). CI = confidence intervals, SE = standard error.

Figure 1

Marginal Effects Plot of the Interaction Between Online Social Connectedness and Online Masking on Self-Esteem Amongst Passive Social Media Users



Note. The interaction plot shows predicted self-esteem (y axis) for levels of online masking (low: -1SD from the mean = 85, medium: mean = 107, high: +1SD from the mean = 128) as online social connectedness changes (intervals from 30-110 with steps of 10). OSCS-R = Online Social Connectedness Scale Revised, CATO-Q = Camouflaging Autistic Traits Online Questionnaire, RSES = Rosenberg Self-Esteem Scale.

Discussion

This study aimed to explore links between online social connectedness, online masking, and how these interact with self-esteem, whilst controlling for offline versions of these variables and other covariates. Broadly, the findings support H1 and H2 in showing that higher levels of online social connectedness and lower levels of online masking are associated with higher self-esteem in autistic adult social media users. Contrary to our predictions, however (H3), no interaction was found between online social connectedness and online masking on self-esteem. Generally, these findings were relatively robust to the inclusion of covariates and *post-hoc* sensitivity analyses, with the exception that online social connectedness fell from significance earlier on in the sequence of analyses for passive and active users (e.g., after controlling for offline variables). Further, a significant interaction was found between online social connectedness and online masking for passive social media users.

In line with H1, higher online social connectedness was significantly associated with higher self-esteem, suggesting that online social connectedness may enhance self-esteem for autistic adults (though more on possible directions of causality later). This is consistent with previous research highlighting social media as a context for social connectedness for autistic individuals (Van Schalkwyk et al., 2017; Mazurek, 2013; Ward et al., 2018; Gillespie-Lynch et al., 2014), and that online social connectedness may positively support wellbeing (Frost & Rickwood, 2017; Erfani & Abedin, 2018; Williams, 2019; Verduyn et al., 2017). The findings provide tentative support for the ICBF in the context of autistic adult social media users.

Whilst both online and offline social connectedness were individually associated with self-esteem, online social connectedness was not retained in the model when other covariates were included, contrary to H4. This suggests that the association may be influenced by other factors or third variable effects. In contrast, offline social connectedness appeared more robust. One possibility is that offline connections may be more meaningful and of higher quality, and therefore contribute more directly to wellbeing. This speaks to previous research suggesting that online relationships do not substitute offline connections (Agarwal et al., 2008; Burke et al., 2010; Hassrick et al., 2021). Autistic individuals may also use social media more for non-social purposes like entertainment and information seeking (Alhujaili et al., 2022; Begara-Iglesias et al., 2019; Gillespie-Lynch et al., 2014). Therefore, *offline* relationships may be more closely related to self-esteem.

Further, the relationship between online social connectedness and self-esteem may be partially explained by covariates, like age. There may be a cohort effect: as the mean age of the current sample was 39.20, offline relationships may hold greater relevance than newer social media-based relationships (Chang et al., 2015; Anderson & Jiang, 2018).

In line with H2, higher levels of online masking were significantly associated with lower self-esteem, robust to the inclusion of covariates (H4). This highlights the detrimental impact of online masking on autistic adults' self-esteem (though more on possible directions of causality later). Previous research has linked offline masking to poorer mental health outcomes for autistic individuals (Cook et al., 2021; Hull et al., 2021; Hull et al., 2017; Cage & Troxell-Whitman, 2020; Cage et al., 2018). This study establishes the psychological risks of masking in the *online* context, suggesting that online masking is distinct from, rather than a proxy for, offline behaviour. Masking is

thought to stem from internalised stigma and perceived difference (Pearson & Rose, 2021). If autistic social media users unfairly perceive themselves as ‘different’, online masking may reflect a disconnecting pattern of social media use associated with poorer mental health outcomes, which provides tentative support for the ICBF.

Contrary to our predictions, no significant interaction between online social connectedness and online masking was found in our main analysis. This suggests that online connectedness may not buffer the link between online masking and lower self-esteem, nor does masking appear to weaken the positive association between online connectedness and self-esteem (at least in the sample as a whole). This mirrors findings in the offline context (Cage et al., 2022), where strong autistic community connectedness did not buffer the negative effects of masking on wellbeing.

Whilst we predicted that online connectedness may create a sense of safety and reduce masking (Hull et al., 2017; Milner et al., 2022; Bradley et al., 2021; Cage et al., 2020; Evans et al., 2024), thereby facilitating increases in self-esteem, challenges may also be experienced with online social relationships (Agarwal et al., 2008; Hassrick et al., 2021; Burke et al., 2010). Features of the online environment, such as the ‘online disinhibition effect’ (i.e., where features like anonymity provide individuals with fewer social constraints in online interactions; Suler, 2004), alongside the size of online audiences, suggest a real possibility of negative online experiences. Autistic individuals may also face discrimination and stigma online (Cage et al., 2022; Bury et al., 2024; Hungerford et al., 2025). If masking is related to feeling accepted and safe in social spaces (Evans et al., 2024), the online world, even when socially connected, may not feel sufficiently safe enough for a reduction in masking.

Another explanation for the non-significant interaction in the main analyses may be the lack of measuring specific social media platforms' affordances. Research suggests that different platforms and their respective affordances may relate differently to wellbeing (Tibber et al., 2022; Nesi et al., 2018; Ward et al., 2018; Pittman & Reich, 2016). For example, autistic Facebook users reported greater happiness than autistic X (Twitter) users, which the authors hypothesised as related to differing platform features (Ward et al., 2018). Although we focused on SNS to explore primarily *social* platforms in the first instance, the study did not explore the potential of different patterns of effects as a function of platform type. Therefore, an interaction may have been more likely if we had focused specifically on social platforms.

Alternatively, the effect may be moderated by a variable not included in the analysis, such as *how* social media is used (i.e., passive/active – more on this below). It is also possible that the effect may exist, but that the current study lacked sufficient power to detect it.

With respect to the *post-hoc* analyses, the findings from the main analyses were generally robust. However, we found a significant interaction between online social connectedness and online masking for passive social media. Thus, for individuals who reported greater online social connectedness, the relationship between online masking and lower self-esteem was weaker, implying that higher online social connectedness may buffer against the negative impact of online masking on self-esteem.

The significant interaction observed in the passive user group should be interpreted with caution due to the small sample size, thereby reducing power and increasing the potential for spurious findings. However, if the significant interaction is

genuine, it could be explained by passive users reporting significantly higher online masking and significantly lower social connectedness compared to active users, suggesting that passive users may have self-esteem more contingent on social connectedness. It is worth noting that the passive/active distinction has been criticised for lacking conceptual clarity and lacking use of validated measures (Valkenburg et al., 2022; Godard & Holtzman, 2024). Indeed, we included a custom single-item to measure engagement with social media. We aimed to respond to the suggestion made in the EbE focus group, recognising the importance of amplifying autistic voices, who have been historically underrepresented in research (Cage et al., 2024). Nonetheless, the finding is interesting and warrants further exploration.

Implications

The findings that higher online social connectedness and lower online masking are associated with higher self-esteem align broadly with the ICBF. This reinforces the idea that social media may provide opportunities for connection for autistic individuals (Van Schalkwyk et al., 2017; Mazurek, 2013; Ward et al., 2018; Gillespie-Lynch et al., 2014), whilst also establishing masking online (Jedrzejewska & Dewey, 2022), both with implications for mental health (Ward et al., 2018; Hassrick et al., 2021). These associations survived after controlling for offline versions of the variables, suggesting the associations are not simply a proxy for offline behaviours. Therefore, this study points to the value of incorporating exploration of individuals' social media use in clinical assessment, formulation, and (where indicated) clinical intervention (Tibber & Silver, 2022).

Future clinicians should explore masking in both online and offline contexts to better understand its impact on mental health, since we present evidence that *online* masking predicts unique variance in self-esteem, over and above that explained by

offline masking. The consistent association between online masking and lower self-esteem, even after controlling for covariates, reinforces the need to understand the potentially harmful impact of autistic masking on wellbeing across multiple contexts. Moreover, this highlights the need for a systemic approach to foster more inclusive, neurodivergent-affirmative online communities.

Future Research

The absence of a significant interaction in the main analysis does not preclude the existence of this relationship and warrants further exploration. Future research should explore factors that may reduce online masking, with the aim to support wellbeing. Adopting a qualitative (and/or mixed) design to gain a richer, more nuanced understanding of the relevant constructs and potential interaction with contextual factors may be valuable.

Future research should further explore differences between autistic active/passive users in how online social connectedness and masking relate to self-esteem with a larger sample size. Whilst the value of the passive/active distinction has been debated (Valkenburg et al., 2022; Godhard & Holtzman, 2024), this has not been explored thoroughly with autistic social media users. Additionally, it would be helpful to understand *how* individuals are masking online (e.g., tone and language, use of filters, use of scripts), which could assist the understanding of the passive/active distinction and relationship with self-esteem.

As discussed, previous research suggests that different platform affordances are associated with wellbeing outcomes (Tibber et al., 2022; Nesi et al., 2018; Ward et al., 2018; Pittman & Reich, 2016). Therefore, future research could include different platforms as potential moderators to further understand the experiences of online social connectedness, masking, and self-esteem for autistic users. This would

ultimately facilitate a deeper understanding of the relative benefits and harms for autistic social media users.

Limitations

Due to the study's cross-sectional design, we were unable to determine directions of causality. Whilst significant associations were observed between online masking, online social connectedness, and self-esteem, the direction of these relationships cannot be determined. For example, it may be that lower self-esteem leads individuals to engage in higher levels of online masking as a protective strategy to avoid negative social evaluation (Lee & Stapinski, 2012; Valkenburg & Peter, 2007). Conversely, individuals with higher self-esteem esteem may be more confident to engage in the online world, which may support online social connectedness and reduce the perceived need to mask (Mazurek, 2013; Orth et al., 2012; Hedley et al., 2018). Bi-directionality is also possible, with social media use and wellbeing potentially influencing each other over time (Wang et al., 2017). Given these complex dynamics, research utilising alternative designs (e.g., longitudinal and/or experimental) is needed to understand the underlying mechanisms and to make causal inferences.

Longitudinal studies may be more suited to infer directions of causality and to explore possible bi-directional relationships between social media use and mental health (Griffioen et al., 2020; Parry et al., 2021), helping to establish whether higher online social connection and lower online masking predict higher levels of self-esteem, or vice versa. Further, experimental designs would allow researchers to test causal hypotheses and observe effects on wellbeing outcomes (Best et al., 2014). However, as social media is near ubiquitous, implementing a true experimental design may be challenging, as control groups are likely to have prior exposure or

ongoing access, potentially weakening experimental control. Given that this is an emerging field, adopting a qualitative (and/or mixed) design can provide valuable insights into individual experiences and navigating these processes, enriching quantitative findings with deeper contextual insight. These alternative research designs would allow for a richer insight into the relationship between online social connectedness, online masking, and self-esteem, which is key for developing effective interventions aimed to enhance psychological wellbeing in an increasingly digital world.

A second limitation is the use of self-report questionnaires. This may have introduced recall bias, as participants may not accurately assess their own behaviours on social media (Parry et al., 2022). Additionally, some of the measures (OSCS-R, SCS-R, and RSES) used were not specifically designed with autistic individuals, reflecting broader criticisms of measures of social connection not being specifically designed with autistic individuals in mind (Mournet et al., 2024). Although the RSES and SCS-R have been used with autistic participants previously (Rice, 2022; Cooper et al., 2017; Mazurek, 2014; Hillier et al., 2018), and consultation occurred with EbE collaborators and focus group participants on study design, the constructs may not fully capture the experiences of autistic individuals. These factors may limit the validity of the findings.

Other limitations surround the representativeness of the sample. It was not a requirement of the study to provide evidence of autism diagnosis, nor to complete a measure of autistic traits. As a result, there is a possibility of misclassification within the sample, although recruiting through autistic charities minimises this potential bias. Whilst recruiting a large proportion of participants who identified as female is a strength – a group who often lack access to autism services (Lockwood-Estrin et al.,

2020) – the sample is overrepresented by White participants, limiting the generalisability to other autistic adults from minority backgrounds. As autism can present differently across intersecting identities (Pearson & Rose, 2021), future studies should aim to purposefully recruit participants from more ethnically diverse backgrounds to improve generalisability.

Conclusions

Overall, this study found associations between online social connectedness, online masking, and self-esteem for autistic adult social media users, which are broadly consistent with the ICBF. It is hoped that the findings will converge with other literature to promote the incorporation of social media use into clinical sessions within mental health services. Future research should aim to consider different platform affordances and online social connectedness, the differences in passive/active users, and facilitators and mitigators of online masking. This would allow for a more nuanced understanding of the relative merits and harms of social media use on mental health outcomes in autistic adults.

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Part Three: Critical Appraisal

Introduction

This chapter is a critical appraisal of my reflections on the experience of undertaking the research project as part of the UCL Doctorate in Clinical Psychology. Starting with contextualising how my previous clinical and research experiences influenced my project selection, I will then discuss more broadly the processes of the systematic literature review and empirical project, reflecting on difficulties and learnings from these processes. Finally, I will consider the implications on my future approach to research and clinical practice.

Background and Project Selection

Previous Clinical and Research Experience

Prior to clinical training, I was a Psychological Wellbeing Practitioner (PWP). Across the two years of working as a PWP, I felt that this had provided me foundational knowledge and a wealth of experience in Cognitive Behavioural Therapy (CBT), common mental health difficulties, and working with adults. I was excited that clinical training would offer the opportunities to gain skills in therapeutic modalities and work with populations and presentations of distress that I was less familiar with.

In addition to my clinical caseload, I was the ‘young adults champion’ in my Improving Access to Psychological Therapy (IAPT) service. Within this role, I created and piloted a low intensity CBT group for young adults accessing the service. It was through the process of researching and creating the materials for the group when I first encountered the research on the risks and benefits of social media. I noticed the dominance of ‘concern-centric’ narratives surrounding social media and mental health for young people (Orben et al., 2020), which has garnered much attention in the literature and wider public discourse (Orben, 2020). Indeed, the group material

echoed these concerns, linking negative mental health outcomes with time spent online. Further, I recall participants in the group reflecting on their negative experiences with the online world, particularly in relation to negative social comparisons and the impact on their self-esteem. However, we also had discussions around the positives of social media, including finding community and keeping up with friends. This experience, alongside my own personal use of social media, made me curious to further understand the complex relationship between social media use and mental health outcomes further.

I had little direct research experience prior to clinical training. I had conducted a quantitative, online, experimental study as part of my undergraduate degree with three other undergraduate psychology students. Our topic surrounded sexual harassment in the nighttime scene, investigating the relationship between constructs such as pluralistic ignorance and bystander behaviour. When considering applying for the clinical doctorate, I sought to increase my experience with research through participating in my trust's journal club, and through volunteering monthly to write for The Mental Elf service, which aims to provide individuals with current health and social care research in short, digestible written formats. My relative lack of direct research experience (compared to my clinical experience) prior to training translated into feeling both daunted and excited by the prospect of undertaking a major research project.

Project Selection

When selecting the project, I took a wide variety of factors into consideration, including my previous clinical and research experience, professional interests and values, and personal motivations.

Considering my previous research experience, I recognised that I wanted to build my confidence in my research skills. Therefore, I sought out a research project that would give me experience across the entire research process – from initial setup and data collection to analysis and final write-up. Whilst motivated by this prospect, I felt that it was important to draw on my existing strengths and experience (e.g., involving quantitative methods) to make the process less daunting, in addition to seeking a project with clear aims and requirements.

With respect to my previous clinical experience, one of my main aims for clinical training was to gain insight into areas I was less familiar with. The choice of topic for the major research project felt like a good opportunity for this. As I did not have a specific area of interest when selecting a project, I considered choosing an area that would be relevant across multiple clinical contexts. This is where I began to reflect on the possibility of a project with autistic individuals. I hoped that this would provide me with theoretical knowledge of autism and neurodiversity more widely, which I would be able to use in my clinical work more confidently. Within this, I hoped that a project would have the possibility of elements of co-production. As someone who is neurotypical, seeking a project that offered the possibility of elements of co-production felt especially important, to enhance the relevance and impact of the findings.

Given the research project spanned all three years of clinical training, it was important that I felt both professionally and personally motivated by the topic. Further, I also wanted the project to have the potential to resonate with public discourse and be applicable to multiple wider systems, reflecting my interest in working systemically and with broader societal impact, which felt especially relevant to the topic of social media. I felt that research, policies, and guidelines on the link

between social media use and mental health felt poorly understood, particularly concerning the experiences of autistic individuals. As a social media user myself (alongside my friends and family), I felt personally motivated by the content of the project.

Together, all these factors felt balanced when I selected the project examining online social processes, social media use, and mental health outcomes in autism. With my thesis choice, I hoped to improve my research skills, and gain specific insight and knowledge into the experiences of autistic individuals that would support my clinical practice. When meeting with my supervisor (Marc Tibber) to discuss the project, I connected with his non-alarmist position, acknowledging both the potential harms and benefits of social media use. The project offered an opportunity to explore the often divisive topic of social media and mental health, with the potential to bring clarity to a broad and complex field by introducing a focused lens that accounted for individual differences and added nuance to public discourse. Ultimately, I felt that this project would contribute important clinical findings and have real-world implications.

The Research Process

Systematic Literature Review

Picking the Topic

The topic for the literature review was developed through discussions with my supervisor, with the aim to link the area to my empirical project. Whilst investigating online social processes for autistic social media users, we considered how these processes may be experienced by other neurodivergent identities, like individuals with ADHD. Reflecting on my aims for training, I was motivated to gain experience in less familiar subject areas. In particular, I was drawn to exploring the experiences of ADHD individuals online, especially as we had not received teaching on ADHD. The

topic was receiving significant media attention (e.g., Gregory, 2024), so it felt particularly relevant.

From conducting brief scoping searches of the literature to inform my research question(s), I noticed that much of the existing literature on ADHD and social media use narrowly attempted to make links between ADHD 'symptoms' and 'problematic' or 'addictive' uses of social media (e.g., Farchakh et al., 2022; Ra et al., 2018; Beyens et al., 2018). With this perspective in mind, we felt that exploring social *dis*-connectedness (alongside social connectedness) could add valuable nuance to understanding the relationship between social media use and wellbeing for autistic and ADHD users.

Through further research on my part, we did not find existing systematic reviews exploring social media use and social connectedness/*dis*-connectedness in autism and ADHD altogether. Therefore, we agreed that this would be the topic of my systematic review. We hoped that gaining insight into these social processes and outcomes for autistic and ADHD individuals could inform ways to reduce potential risks and enhance the positive aspects of social media use. Further, a systematic review offered the opportunity bring structure and clarity to the existing literature that often felt difficult to navigate.

Reflecting on Conceptualisation of Constructs

One of the initial challenges was deciding how to conceptualise social media when setting inclusion and exclusion criteria for the systematic review. Given the relative novelty of research on online social connectedness/disconnectedness in autistic and ADHD social media users, it felt important to adopt a broad definition of social media. However, an overly broad scope risked overwhelming the review and the number of returned papers. This challenge became clear during preliminary

scoping searches, which highlighted how varied and inconsistent the definition, conceptualisation, and operationalisation of social media is in the literature, reflecting wider issues of lack of conceptual clarity in the field (Kross et al., 2021; Yang et al., 2021).

The overlapping affordances of social media (Nesi et al., 2018) further complicated decisions around setting inclusion and exclusion criteria. I found this lack of consensus in the literature difficult to navigate. My own perfectionist tendencies (more on this later) made it challenging to feel confident about setting the criteria. Nevertheless, specific inclusion/exclusion parameters were essential to ensure consistency, transparency, and relevance, and to keep the review manageable (Cherry et al., 2024).

Although we recognised the overlapping affordances of digital technologies (Nesi et al., 2018; Kross et al., 2021), we made the decision *a priori* to exclude studies focusing exclusively on gaming. This was based on the rationale that social media's core functionality is for social interaction, whereas gaming, though sometimes social (Colder-Carras et al., 2017), can also be solitary (Vella et al., 2016) and occur offline.

Ultimately, we adopted a broad search strategy to capture as many relevant studies as possible. I felt confident in the rationale behind our criteria, and learned the importance of defining clear parameters early on – an insight I will carry forward into future research.

Reflecting on Screening

I had not anticipated how time-consuming the screening process would be. As noted above, we adopted a broad conceptualisation of the key concepts to capture as many relevant papers as possible. However, this resulted in a large volume of

papers that were returned in the final search – even after removing duplicates – which made the screening process time-intensive. Ambiguities at the title and abstract stage, combined with my fear of missing relevant studies, led to a high number of papers being taken through to the full text screening stage, further extending the process.

At one point, I worried that I had made an error when comparing the number of returned and screened papers to some of my peers in the cohort. However, discussions with my supervisor and guidance on conducting systematic reviews (Cherry et al., 2024) reassured me that there was no ‘correct’ number of papers to return or screen. Given the broad search strategy, a large volume of papers was expected, and I hoped that this had met my aim of capturing relevant studies to answer the research question(s). I focused on managing my time effectively to complete the screening process.

Although time-consuming, screening a large number of papers strengthened my confidence in my decision making for included papers, and provided a valuable foundation for my empirical paper by uncovering relevant studies that I might have otherwise missed.

Reflecting on the Process

A further challenge came with the quality appraisal tool. Quality appraisal tools have been criticised regarding their subjective nature and potential for misapplication (Katrak et al., 2004; Crowe & Sheppard, 2011), and my experience of using Kmet and colleagues’ (2004) quality appraisal tool in part mirrored these wider criticisms surrounding subjectivity. However, Kmet’s toolkit was helpful in providing a structured framework to evaluate the studies. It was beneficial to have the support from another trainee to independently quality assess 100% of the included papers, which helped

to reduce bias in the decision-making. Additionally, incorporating the custom-written items on use of established measures and inclusion of effect sizes allowed us to more rigorously assess study quality, whilst also improving our understanding and interpretation of the findings.

Overall, conducting the systematic review was challenging at times, particularly due to the volume of independent decision-making and time required, which reflects my initial naivety, having never conducted a literature review before. Nonetheless, it was an invaluable learning experience and deeply rewarding to see the finished piece come together during the write-up stage.

Empirical Paper

Conceptualising the Project

Following initial discussions with my supervisor and the collaborators on the project, the project was helpfully fleshed out in its scope and aims. The first task involved researching the constructs (i.e., social media, social connectedness, masking, self-esteem) both in research with neurotypical and autistic individuals, with the aim to find appropriate tools to operationalise the constructs.

I remember feeling somewhat lost and overwhelmed when engaging with the literature in the first few weeks. Similarly to my experience of the systematic review process, I noticed my perfectionist tendencies here. It felt challenging to choose the most appropriate tools that would accurately capture the experiences of autistic individuals. For example, it has been argued that few measures of social connectedness have been specifically designed with autistic individuals in mind (Mournet et al., 2024). However, discussions with the expert-by-experience (EbE) collaborator and EbE focus group participants provided reassurance on the measures used in the project. Further, the EbE focus group's suggestion to include

an optional text box for participants to add context and comments to their answers was a valuable addition. This exemplifies how their input meaningfully shaped the project (more on this later).

Another important consideration more widely in the construction of the survey was the number of items and length of time to complete. Research suggests that longer online surveys are associated with higher rates of participant dropout (Hoerger, 2010). Therefore, it was important to consider the survey completion time to minimise burdening participants, whilst also capturing data that was important to the project (e.g., incorporating offline versions of the measures). I am grateful to those who tested the time to complete the survey, as this helpfully informed our recruitment materials.

Challenges During the Project

An important moment in the project arose during recruitment, concerning the inclusion criteria of requiring a formal autism diagnosis (in the project's initial form). When initially circulating the survey on social media channels, we received multiple concerns raised from members of the autistic community voicing that the exclusion of self-identifying autistic individuals would limit the scope of the project in terms of representation and inclusivity. This speaks to the barriers to obtaining a formal diagnosis, such as systemic inequalities (Pearson & Rose, 2021; Kelly et al., 2019; Hosozawa et al., 2020; Kandeh et al., 2020; Loomes et al., 2017). Therefore, excluding self-identifying participants risked reinforcing disparities in access to diagnostic services and marginalising underrepresented voices. My supervisor and I discussed the feedback with our collaborators and unanimously agreed to amend our ethics application to include self-identifying autistic participants.

Although I believed we had made the right decision and was pleased with the outcome, I also felt frustrated and guilty about our initial choice. This sat uncomfortably with my personal and professional values surrounding issues of power and social justice. Although I reflect on issues of power and social graces (Burnham, 2012) in my clinical work, this was the first time I was directly confronted with this in the context of research. Despite feeling I had let myself down, the experience offered valuable learning that I will carry into future research and prompted broader reflections on viewing the research process as a journey.

Bot activity was another potential challenge in the recruitment process. Recruiting via social media (alongside other methods) and offering a prize draw raised the risk of receiving bot-generated responses. To address this, we followed guidance (Lawlor et al., 2021; Lebrun et al., 2024; Storozuk et al., 2020) to identify and exclude suspected bot data. Whilst these measures helped, the process felt subjective at times. However, the support from my supervisor and a fellow trainee helped to bring structure and objectivity to the decision-making process.

Reflecting on Expert-by-Experience Collaboration

An aspect of the project I particularly valued were the elements of collaboration with autistic individuals. Consultations and discussions with the EbE collaborator on elements including the original proposal, survey design, and recruitment, and piloting the survey with the EbE focus group provided invaluable insight, knowledge, and perspectives that helped shape the project. This input was particularly valuable given my neurotypical perspective; it enabled the project to be shaped by lived experience, and more generally developed my wider understanding of autistic experiences through fruitful discussions. Further, this would hopefully

mean that the findings could more accurately reflect and represent the autistic adult community regarding their experiences of social media.

Implications

This project has highlighted the importance of collaboration and co-production in future research. Working with collaborators and EbE individuals, feedback from the autistic community during recruitment, and applications for recruitment through Autistica and National Autistic Society, made me reflect on the importance of research meeting the needs, questions, and priorities of autistic individuals and their families. Ultimately, this would mean that research findings are more relevant, grounded in lived experience, and more likely to have real-world impact through increasing the likelihood of being acceptable to autistic individuals (i.e., who the research is intended to support). This more widely fits with my professional values surrounding inclusivity, empowerment, and shifting deficit-focused narratives to strengths-based approaches. I hope to gain more direct research experience grounded in co-production in the future.

Considering the field of social media more widely, both the systematic review and empirical project have highlighted potential underlying mechanisms into the link between social media use and mental health outcomes for autistic (and ADHD) users. It would be important for future research to continue to explore this link, particularly in the context of social media's continued development in terms of affordances, new platforms, and purposes of use. For example, the emergence of TikTok as a dominant platform with widespread reach has raised concerns in the literature regarding misinformation about autism (Brown et al., 2024; Steiner-Hofbauer et al., 2025; Aragon-Guevara et al., 2025). I would be interested to see how the constructs explored in this thesis relate and remain relevant as platforms

like TikTok continue to evolve, particularly in shaping identity, community connectedness, and the spread of information (or misinformation) about neurodivergence.

Personal Reflections

Across the three years of conducting the major research project, I felt that I struggled with perfectionist tendencies at times. Perfectionism has been identified amongst trainee psychologists, and associated with negative wellbeing outcomes (Richardson et al., 2018). Although this did not impact me to a clinically distressing level, I noticed that my perfectionist tendencies at times seeped into my ability to make decisions during times of greater subjectivity (e.g., selecting measures, quality appraisal). When I noticed this impacting my decision-making, I found it helpful to return to my research journal and the rationale behind various decisions, which was supported by the literature (when required). Over time, as I gained more experience in the research process, I grew more confident in the decisions that we made.

I found the research process, particularly in third year during the analysis and write-up stages, isolating at times. I was curious as to whether I would have felt differently if I had been part of a research team, where stages of the project (e.g., data collection and analysis) may have been a joint process with responsibilities shared. Additionally, I wondered whether decision-making would have felt easier if this was more shared. On the other hand, I am immensely proud of independently conducting the research, with the support of my supervisor and collaborators. Further, it was helpful to connect with my peers to normalise the challenges of the research process, which speaks to research that highlights that peer support is valuable in managing the stress and the demands of clinical training (Cushway, 1992; Kuyken et al., 2003). I also sought connectedness through my friends (outside

of the course) and my family to help to manage the multiple demands of the research and course more widely.

Conclusions

Overall, the experience of conducting the major research project was invaluable in improving my research knowledge, skills, and confidence. The process was both interesting and challenging, with many opportunities for learning and professional development. It was exciting to be a part of a rapidly evolving topic (social media) that receives much attention in public discourse. Whilst experimental and longitudinal designs remain essential to unpick the directions of causality between social media use and mental health, I believe my project has offered meaningful insight into online social processes and wellbeing outcomes for autistic (and ADHD) users. I hope these findings can contribute to future co-produced guidance and resources that support neurodivergent individuals online. Further, I valued the elements of collaboration with autistic individuals, which importantly highlighted the value to co-production and wider issues of power within the context of research. Ultimately, the experiences gained whilst conducting this project have complemented my clinical practice.

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Appendix 1

Search Strategies for MEDLINE, Embase, PsycINFO, and Web of Science

MEDLINE (Ovid)

Ovid MEDLINE(R) ALL <1946 to September 17, 2024>

1 ("Cellphone Use" or "Cell-Phone Use" or "Cell Phone Use" or Computer Mediated Communication or Cyber or ICT or Internet or "Internet Use" or Internet Communication or Media Exposure or Online or Online Behaviour or Online Behavior or Online World or "Smartphone Use" or "Smart-Phone Use" or "Smart Phone Use" or Social Media or Social Network* or "Use of Cellphone" or "Use of Cell-Phone" or "Use of Cell Phone" or "Use of Smartphone" or "Use of Smart-Phone" or "Use of Smart Phone").ab,kf,ti. 374867

2 (Instagram or Facebook* or TikTok or Twitter or WhatsApp or Snapchat or YouTube or WeChat or Kuaishou or Telegram or Qzone or QQ or Weibo or Douyin or Tumblr or MySpace or Pinterest or Reddit or LinkedIn or Quora or Skype).ab,kf,ti. 24775

3 (ASC or ASD or Asperger* or Autis* or Childhood Disintegrative Disorder or Pervasive Developmental Disorder*).ab,kf,ti. 98205

4 (ADHD or Attention Deficit* or Attention Problem or Hyperkinetic Disorder or HKD or Hyperactive or Inattenti*).ab,kf,ti. 61843

5 (Neuropsychiatric or Neurodiv* or Neurodevelopmental Disorder).ab,kf,ti. 53298

6 (Acceptance or Belonging or Community or Communities or Connect* or Friend* or Emotional Support or Interpersonal Interaction* or Online Communication or Psychosocial Wellbeing or Relation* or Social Assurance or Social Capital or Social Interaction* or Social Support* or Social Wellbeing).ab,kf,ti. 3873229

7 (Cyberbullying or Cyber Bullying or Cybervictimisation or Cybervictimization or Cyber Victimisation or Cyber Victimization or Disconnect* or Fear of Missing Out or FOMO or Isolation or Lonel* or Online Stigma or Peer Victimisation or Peer Victimization or Strangers).ab,kf,ti. 347771

8 Social Media/ 18151

9 Online Social Networking/ 328

10 "Internet Use"/ 680

11 Social Networking/ 5777

12 Smartphone/ 10542

13 Cell Phone/ 10321

14 media exposure/ 22

15 Attention Deficit Disorder with Hyperactivity/ 36473

16 exp Autism Spectrum Disorder/ 46196

17 Social Capital/ 1784

18 Loneliness/ 7306

19 Social Isolation/ 16916

20 Social Cohesion/ 137

21 Cyberbullying/ 716

22 Interpersonal Relations/ 78360

23 Social Interaction/ 2065

24 exp Social Support/ 82617

25 1 or 2 or 8 or 9 or 10 or 11 or 12 or 13 or 14 403027

26 3 or 4 or 5 or 15 or 16 206135

27 6 or 7 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 4235834

28 25 and 26 and 27 1706

Embase (Ovid)

Embase <1974 to 2024 September 17>

1 ("Cellphone Use" or "Cell-Phone Use" or "Cell Phone Use" or Computer Mediated Communication or Cyber or ICT or Internet or "Internet Use" or Internet Communication or Media Exposure or Online or Online Behaviour or Online Behavior or Online World or "Smartphone Use" or "Smart-Phone Use" or "Smart Phone Use" or Social Media or Social Network* or "Use of Cellphone" or "Use of Cell-Phone" or "Use of Cell Phone" or "Use of Smartphone" or "Use of Smart-Phone" or "Use of Smart Phone").ab,kf,ti. 488544

2 (Instagram or Facebook* or TikTok or Twitter or WhatsApp or Snapchat or YouTube or WeChat or Kuaishou or Telegram or Qzone or QQ or Weibo or Douyin or Tumblr or MySpace or Pinterest or Reddit or LinkedIn or Quora or Skype).ab,kf,ti. 31108

3 (ASC or ASD or Asperger* or Autis* or Childhood Disintegrative Disorder or Pervasive Developmental Disorder*).ab,kf,ti. 133086

4 (ADHD or Attention Deficit* or Attention Problem or Hyperkinetic Disorder or HKD or Hyperactive or Inattenti*).ab,kf,ti. 86967

5 (Neuropsychiatric or Neurodiv* or Neurodevelopmental Disorder).ab,kf,ti. 75759

6 (Acceptance or Belonging or Community or Communities or Connect* or Friend* or Emotional Support or Interpersonal Interaction* or Online Communication or Psychosocial Wellbeing or Relation* or Social Assurance or Social Capital or Social Interaction* or Social Support* or Social Wellbeing).ab,kf,ti. 4716433

7 (Cyberbullying or Cyber Bullying or Cybervictimisation or Cybervictimization or Cyber Victimisation or Cyber Victimization or Disconnect* or Fear of Missing Out or FOMO or Isolation or Lonel* or Online Stigma or Peer Victimisation or Peer Victimization or Strangers).ab,kf,ti. 411505

8 social network/ 26749

9 online social network/ 814

10 "internet use"/ 1550

11 exp mobile phone/ 53824

12 exp social media/ 58487

13 autism/ or asperger syndrome/ or childhood disintegrative disorder/ or "pervasive developmental disorder not otherwise specified"/ 98803

14 exp attention deficit hyperactivity disorder/ 15986

15 social connectedness/ 2029

16 social cohesion/ 935

17 social capital/ 4338

18 loneliness/ 16738

19 social isolation/ 35224

20 cyberbullying/ 1277

21 social interaction/ 78604

22 social acceptance/ 4100

23 peer acceptance/ 341

24 social interaction/ 78604

25 exp social support/ 128663

26 neurodiversity/ 443

27 1 or 2 or 8 or 9 or 10 or 11 or 12 561468

28 3 or 4 or 5 or 13 or 14 or 26 292405

29 6 or 7 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 5147681

30 27 and 28 and 29 2960

PsycINFO (Ovid)

APA PsycInfo <1806 to September 2024 Week 2>

1 ("Cellphone Use" or "Cell-Phone Use" or "Cell Phone Use" or Computer Mediated Communication or Cyber or ICT or Internet or "Internet Use" or Internet Communication or Media Exposure or Online or Online Behaviour or Online Behavior or Online World or "Smartphone Use" or "Smart-Phone Use" or "Smart Phone Use" or Social Media or Social Network* or "Use of Cellphone" or "Use of Cell-Phone" or "Use of Cell Phone" or "Use of Smartphone" or "Use of Smart-Phone" or "Use of Smart Phone").ab,kf,ti. 0

2 (Instagram or Facebook* or TikTok or Twitter or WhatsApp or Snapchat or YouTube or WeChat or Kuaishou or Telegram or Qzone or QQ or Weibo or Douyin or Tumblr or MySpace or Pinterest or Reddit or LinkedIn or Quora or Skype).ab,kf,ti. 0

3 (ASC or ASD or Asperger* or Autis* or Childhood Disintegrative Disorder or Pervasive Developmental Disorder*).ab,kf,ti. 0

4 (ADHD or Attention Deficit* or Attention Problem or Hyperkinetic Disorder or HKD or Hyperactive or Inattenti*).ab,kf,ti. 0

5 (Neuropsychiatric or Neurodiv* or Neurodevelopmental Disorder).ab,kf,ti. 0

6 (Acceptance or Belonging or Community or Communities or Connect* or Friend* or Emotional Support or Interpersonal Interaction* or Online Communication

or Psychosocial Wellbeing or Relation* or Social Assurance or Social Capital or Social Interaction* or Social Support* or Social Wellbeing).ab,kf,ti. 0

7 (Cyberbullying or Cyber Bullying or Cybervictimisation or Cybervictimization or Cyber Victimisation or Cyber Victimization or Disconnect* or Fear of Missing Out or FOMO or Isolation or Lonel* or Online Stigma or Peer Victimisation or Peer Victimization or Strangers).ab,kf,ti. 0

8 social network/ 0

9 online social network/ 10525

10 "internet use"/ 0

11 exp mobile phone/ 8570

12 exp social media/ 26845

13 autism/ or asperger syndrome/ or childhood disintegrative disorder/ or "pervasive developmental disorder not otherwise specified"/ 59564

14 exp attention deficit hyperactivity disorder/ 0

15 social connectedness/ 978

16 social cohesion/ 457

17 social capital/ 8082

18 loneliness/ 8020

19 social isolation/ 9787

20 cyberbullying/ 3009

21 social interaction/ 29254

22 social acceptance/ 7378

23 peer acceptance/ 0

24 social interaction/ 29254

25 exp social support/ 47205

26 neurodiversity/ 458

27 1 or 2 or 8 or 9 or 10 or 11 or 12 34916

28 3 or 4 or 5 or 13 or 14 or 26 59745

29 6 or 7 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 108555

30 27 and 28 and 29 17

31 ("Cellphone Use" or "Cell-Phone Use" or "Cell Phone Use" or Computer Mediated Communication or Cyber or ICT or Internet or "Internet Use" or Internet Communication or Media Exposure or Online or Online Behaviour or Online Behavior or Online World or "Smartphone Use" or "Smart-Phone Use" or "Smart Phone Use" or Social Media or Social Network* or "Use of Cellphone" or "Use of Cell-Phone" or "Use of Cell Phone" or "Use of Smartphone" or "Use of Smart-Phone" or "Use of Smart Phone").ab,id,ti. 228758

32 (Instagram or Facebook* or TikTok or Twitter or WhatsApp or Snapchat or YouTube or WeChat or Kuaishou or Telegram or Qzone or QQ or Weibo or Douyin or Tumblr or MySpace or Pinterest or Reddit or LinkedIn or Quora or Skype).ab,id,ti. 17130

33 (ASC or ASD or Asperger* or Autis* or Childhood Disintegrative Disorder or Pervasive Developmental Disorder*).ab,id,ti. 73912

34 (ADHD or Attention Deficit* or Attention Problem or Hyperkinetic Disorder or HKD or Hyperactive or Inattenti*).ab,id,ti. 53751

35 (Neuropsychiatric or Neurodiv* or Neurodevelopmental Disorder).ab,id,ti. 27992

36 (Acceptance or Belonging or Community or Communities or Connect* or Friend* or Emotional Support or Interpersonal Interaction* or Online Communication

or Psychosocial Wellbeing or Relation* or Social Assurance or Social Capital or Social Interaction* or Social Support* or Social Wellbeing).ab,id,ti. 1739184

37 (Cyberbullying or Cyber Bullying or Cybervictimisation or Cybervictimization or Cyber Victimisation or Cyber Victimization or Disconnect* or Fear of Missing Out or FOMO or Isolation or Lonel* or Online Stigma or Peer Victimisation or Peer Victimization or Strangers).ab,id,ti. 75410

38 Computer Mediated Communication/ 7010

39 exp social media/ 26845

40 internet/ 31822

41 Internet Usage/ 3515

42 Media Exposure/ 2364

43 exp mobile devices/ 12628

44 exp autism spectrum disorders/ 59792

45 exp attention deficit disorder/ 33728

46 Neurodiversity/ 458

47 exp social networks/ 25685

48 Social Connectedness/ 978

49 Social Capital/ 8082

50 Cyberbullying/ 3009

51 Online Community/ 2627

52 interpersonal relationships/26680

53 Interpersonal Interaction/ 34029

54 Loneliness/ 8020

55 Social Interaction/ 29254

56 Friendship/ 11469

57 Social Isolation/ 9787

58 Peer Relations/ 19134

59 exp social support/ 47205

60 exp social acceptance/ 12493

61 31 or 32 or 38 or 39 or 40 or 41 or 42 or 43 248988

62 33 or 34 or 35 or 44 or 45 or 46 146267

63 36 or 37 or 47 or 48 or 49 or 50 or 51 or 52 or 53 or 54 or 55 or 56 or 57 or 58 or 59 or 60 1817051

64 61 and 62 and 63 2049

Web of Science (Core Collection)

Search #1: (“Cellphone Use” or “Cell-Phone Use” or “Cell Phone Use” or “Computer Mediated Communication” or Cyber or ICT or Internet or “Internet Use” or “Internet Communication” or “Media Exposure” or Online or “Online Behaviour” or “Online Behavior” or “Online World” or “Smartphone Use” or “Smart-Phone Use” or “Smart Phone Use” or “Social Media” or “Social Network*” or “Use of Cellphone” or “Use of Cell-Phone” or “Use of Cell Phone” or “Use of Smartphone” or “Use of Smart-Phone” or “Use of Smart Phone”) OR (Instagram or Facebook* or TikTok or Twitter or WhatsApp or Snapchat or YouTube or WeChat or kuaizhou or Telegram or qbone or QQ or Weibo or Douyin or Tumblr or MySpace or Pinterest or Reddit or LinkedIn or Quora or Skype)

Search #2: (ASC or ASD or Asperger* or Autis* or “Childhood Disintegrative Disorder” or “Pervasive Developmental Disorder*”) OR (ADHD or “Attention Deficit*” or “Attention Problem” or “Hyperkinetic Disorder” or HKD or Hyperactive or Inattenti*) OR (Neuropsychiatric or Neurodiv* or “Neurodevelopmental Disorder”)

Search #3: (Acceptance or Belonging or Community or Communities or Connect* or Friend* or “Emotional Support” or “Interpersonal Interaction*” or “Online Communication” or “Psychosocial Wellbeing” or Relation* or “Social Assurance” or “Social Capital” or” Social Interaction*” or “Social Support*” or “Social Wellbeing”) OR (Cyberbullying or “Cyber Bullying” or Cybervictimisation or Cybervictimization or “Cyber Victimisation” or “Cyber Victimization” or Disconnect* or “Fear of Missing Out” or FOMO or Isolation or Lonel* or “Online Stigma” or “Peer Victimisation” or “Peer Victimization” or Strangers)

Search: #1 AND #2 AND #3

Appendix 2

Further Details about Quality Assessment: Standard Quality Assessment Criteria for Evaluating Primary Research Papers (Kmet et al., 2004)

Each study was evaluated based on how well it met the criteria outlined in the manual (Yes = 2, Partial = 1, No = 0, Not Applicable = NA). A summary score for each study was calculated as per the manual to indicate the overall quality. Unless otherwise stated under the headings below, all criteria were applied in full accordance with the manual.

(i) Research question sufficiently described

(ii) Appropriate study design

(iii) Method of subject selection

Additional consideration was given as to whether studies that recruited participants online was deemed as introducing bias.

2: No bias (as per the manual)

1: Online recruitment

0: No information provided or obviously inappropriate selection (as per the manual)

(iv) Description of participant characteristics

(v) Random allocation of participants

(vi) Blinding of investigators

(vii) Blinding of participants

(viii) Well defined outcome and exposure measures

(ix) Appropriate sample size

(x) Analysis described and appropriate

(xi) Estimate of variance for main outcomes

(xii) Controlled for confounding variables

It was determined that the included studies should be evaluated on whether they controlled for age and gender in the model of interest (e.g., as a control/predictor/confounder variable or through sensitivity analyses). Though the manual advises coding cross-sectional surveys of a single group as 'N/A', age and gender frequently covary with social media use and wellbeing (Booker et al., 2018; Coyne et al., 2023; Krasnova et al., 2017). The following ratings were used:

2: Age and gender controlled

1: Either age or gender controlled

0: Neither age nor gender controlled

(xiii) Results reported in sufficient detail

(xiv) Conclusions supported by results

Extra quality measures:

(xv) Measure of effect size for main outcomes (0 or 1; no or yes)

(xvi) Social media measure valid and reliable (0 or 1; no or yes)

(xvii) Social connectedness/disconnectedness measure valid and reliable (0 or 1; no or yes)

Validity and reliability of measures related to social media and social connectedness/disconnectedness were evaluated using the same criteria. A score of 1 was given if at least one measure for an outcome was both relevant to the research question and previously validated in peer-reviewed studies. This approach was used to ensure that studies were not penalised for including exploratory tools alongside a primary, validated measure. A score of 0 was given when none of the measures aligned well with the research question or had not been validated in previous peer-reviewed research.

The score for outcomes xvi and xvii were summed to provide an overall score of validity and reliability of the measures.

Appendix 3

Table 1

Additional Information for Included Studies

Study	Date of Data Collection	Country of Study	Sample Population	Method of Data Collection	Sampling Strategy	Details of Respondent	Type of Analysis	Any Sub-Analyses/Sensitivity Analyses Included	Nature of Diagnosis	Neurodevelopmental Differences or Mental Health Difficulties Reported
Alhujaili et al., (2022)	Not reported	Canada	Clinical sample attending outpatient child and adolescent psychiatry clinic.	In-person survey	Convenience sample	Self-report	Mann-Whitney U; Chi-square	N/A	Formal diagnosis	Anxiety, depression, ADHD, & other behavioural disorders. Participants seen in clinic for co-occurring difficulties, including ADHD (details not reported).
Cardy et al., (2021)	22nd May - 6th July 2020	Canada	Parents and caregivers of autistic children (< 20yrs)	Online survey	Volunteer sample	Parent/ Caregiver	Ordinal regression	Exploratory predictors of screen time & possible factors modulating impact of COVID-19 on families: number of adults working from home, number of siblings, household salary, parental education, total screen time, number of hours spent on different activities.	Formal diagnosis	Autistic: Anxiety disorders (34%), ADHD (31%), LD (26%). Controls: ADHD (*N* = 17), anxiety (*N* = 5), LD (*N* = 6), other (*N* = 10).
Dawson et al., (2019)	November 2016 to April 2017	USA	9th to 11th graders	Online survey & Facebook profiles coded	Convenience sample	Both	Descriptives; *t*-Tests; Chi-square; Correlation	Teen & parent offline behaviour ratings.	Formal diagnosis	Measured ODD symptoms, depression, anxiety. 11.2% clinically significant depression; 9.5% clinically elevated anxiety symptoms. Excluded participants meeting criteria for pervasive developmental disorder.

Study	Date of Data Collection	Country of Study	Sample Population	Method of Data Collection	Sampling Strategy	Details of Respondent	Type of Analysis	Any Sub-Analyses/Sensitivity Analyses Included	Nature of Diagnosis	Neurodevelopmental Differences or Mental Health Difficulties Reported
Gillespie-Lynch et al., (2014)	Not reported	USA	General population	Online survey	Volunteer sample	Self-report	Nonparametric Mann-Whitney U tests; One-way ANOVAs; *t*-Tests	Demographics & self-reported autism symptoms (AQ) comparing formally diagnosed with self-identifying & comparing characteristics between autistic & non-autistic participants.	Both	None reported.
Gorucu et al., (2020)	March - June 2015	Turkey	Clinical sample from child & adolescent psychiatry polyclinics, & secondary & high school students	In-person surveys & interviews	Convenience sample	Both	*t*-Tests; Mann-Whiney U; Chi-Square; Correlation	Comparison of ADHD & controls on measures; Correlation analyses of OCS sub-scores with cyberbullying & cybervictimisation.	Formal diagnosis	Controls: K-SADS diagnosis higher in cyberbullies than not-cyberbullies; ADHD: K-SADS diagnosis higher in cyberbullies. Excluded participants who were autistic.
Heiman et al., (2015)	Not reported	Israel	Middle & high school students, 7th to 10th graders	In-person surveys	Random selection	Self-report	Regression; Chi-Square; ANOVA; MANCOVA	None reported.	Formal diagnosis	None reported. Participants excluded based on presence of 'neurological disorder'.
Holfeld et al., (2019)	2013-2015	Canada	4th to 12th graders	Online survey	Volunteer sample	Both	Correlation; Multiple regression	None reported.	Self-identifying	None reported. (Measured self-report anxiety & depression as outcome variables in main analyses).
Kuo et al., (2014)	May 2009 - August 2009	USA	General population adolescents	Mailed surveys	Volunteer sample	Both	Chi-Square; *t*-Tests	Factors associated with media use (gender, comorbidity of LD, parental education level, parental employment status, age, autistic symptoms).	Formal diagnosis	ADHD 48%, anxiety 30%, OCD 21%, depression 17%, LD 7%, other 31%.
Lin et al., (2024)	2015-2019	Taiwan	7th to 10th graders	In-person surveys	Multistage stratified sampling	Self-report	Logistic regression	None reported.	Formal diagnosis	None reported. For main analyses, measured levels of depression.

Study	Date of Data Collection	Country of Study	Sample Population	Method of Data Collection	Sampling Strategy	Details of Respondent	Type of Analysis	Any Sub-Analyses/Sensitivity Analyses Included	Nature of Diagnosis	Neurodevelopmental Differences or Mental Health Difficulties Reported
Marsh et al., (2022)	Not reported	USA	8th graders	Interviews/In-person surveys	Convenience sample	Both	Regression; *t*-Test; Chi-square	Compared ADHD & controls on use of SM; ADHD & sex included as covariates.	Formal diagnosis	ADHD: Externalising (ODD/CD) = 21.9%; Anxiety = 28.5%; Depression = 9.3%. Excluded participants who were autistic.
Mazurek (2013)	Not reported	USA	General population	Online survey	Volunteer sample	Self-report	One-way ANOVA; Chi-square; Regression	Tested for differences in SM use based on demographics.	Formal diagnosis	None reported
Mikami et al., (2015)	T1 = summer 1997-1999; T2 = 5yrs later; T3 = 10yrs later	USA	General population from San Francisco Bay area	In-person & telephone surveys, & Facebook profiles.	Volunteer sample	Both	ANCOVA; Mediational models; *t*-Tests	Covariates of disruptive behaviour, internalising comorbidities, age, household income. F2F included as mediator.	Formal diagnosis	T1 ADHD: Anxiety = 19.29%, combined anxiety & depression = 7.14%, ODD = 44.29%, CD = 20.71% T1 Controls: Anxiety = 3.41%, ODD = 6.82%. Excluded participants with pervasive developmental disorder diagnosis.
Tuncturk et al., (2023)	October 2018-January 2019	Turkey	Outpatient clinical sample	In-person interviews	Convenience sample	Self-report	Chi-Square; *t*-Test; ANCOVA; Logistic regression	Adjusted for age in ANCOVA. Explorative post-hoc subgroup analyses comparing groups for psychiatric comorbidities.	Formal diagnosis	ODD, ADHD, MDD, SAD, depression, anxiety, social phobia reported in IGD and PIU groups. Excluded autistic participants.
van der Aa et al., (2016)	25 May 2010 - 25 June 2010	The Netherlands	General population	Online survey	Volunteer sample	Self-report	MANOVA; Chi-square; ANOVA; *t*-Tests; Regression	Comparison on AQ for autistic & control participants.	Both	None reported.
van Schalkwyk et al., (2017)	Not reported	USA	Clinical sample from Yale Child Study Centre	In-person surveys	Convenience sample	Both	Regression; Correlation	Compared on demographic variables & anxiety levels between autistic & non-autistic groups.	Formal diagnosis	None reported. (Measured levels of anxiety for main analyses).

Study	Date of Data Collection	Country of Study	Sample Population	Method of Data Collection	Sampling Strategy	Details of Respondent	Type of Analysis	Any Sub-Analyses/Sensitivity Analyses Included	Nature of Diagnosis	Neurodevelopmental Differences or Mental Health Difficulties Reported
Wright (2017)	Fall 2015	USA	6th to 8th graders	In-person surveys	Volunteer sample	Self-report	Regression; Correlations	Gender & F2F victimisation included as covariates across models.	Formal diagnosis	None reported. (Measured levels of depression & anxiety for main analyses).
Wright (2018)	Fall 2016	USA	7th to 9th graders	In-person surveys	Volunteer sample	Self-report	Regression; Correlations	Gender & F2F victimisation included as covariates across models.	Formal diagnosis	None reported. (Measured levels of depression & anxiety for main analyses).
Wright & Wachs (2019)	Jan-Feb 2016	USA	6th to 8th graders	In-person surveys	Volunteer sample	Self-report	Regression	Gender & F2F victimisation included as covariates across models.	Formal diagnosis	None reported. (Measured levels of depression & anxiety for main analyses).
Yen et al., (2014)	November 2012-November 2013	Taiwan	Clinical sample from child and adolescent psychiatric outpatient clinics	In-person Interviews	Convenience sample	Self-report	Regression	Psychiatric comorbidity added to regression models. Controlled for gender & age.	Formal diagnosis	Measured for autistic traits, LD, ODD/CD. Depression, anxiety, suicidality measured as part of main analyses. 14.3% of participants were also autistic.

Note. ADHD = attention-deficit/hyperactivity disorder; LD = learning disability; ODD = oppositional defiant disorder; AQ = autism quotient; OCS = online cognition scale; K-SADS = schedule for affective disorders and schizophrenia for school-age children, present and lifetime version; OCD = obsessive compulsive disorder; CD = conduct disorder, F2F = face-to-face, MDD = major depressive disorder, PIU = problematic internet use, IGD = internet gaming disorder, SAD = social anxiety disorder.

Appendix 4

Table 2

Additional Information for Study Quality

Study	Standard Quality Assessment Criteria for Evaluating Primary Research Papers (Kmet et al., 2004)														Extra Quality Measures		
	(i) Research question	(ii) Study design	(iii) Subject selection	(iv) Participant characteristics	(v) Random allocation	(vi) Investigator blinding	(vii) Participant blinding	(viii) Well defined measures	(ix) Sample size	(x) Analysis	(xi) Variance	(xii) Confounds	(xiii) Results	(xiv) Conclusions	Effect Size	SC/ SD	SM
Alhujaili et al., (2022)	2	2	1	2	N/A	N/A	N/A	1	1	2	1	0	2	2	No	No	No
Cardy et al., (2021)	2	2	1	2	N/A	N/A	N/A	2	2	2	2	2	2	2	Yes	No	No
Dawson et al., (2019)	2	2	2	2	N/A	N/A	N/A	1	1	2	2	0	2	2	Yes	No	Yes
Gillespie-Lynch et al., (2014)	2	2	2	2	N/A	N/A	N/A	1	2	2	2	0	2	2	Yes	No	No
Gorucu et al., (2020)	2	2	1	2	N/A	N/A	N/A	2	2	2	2	0	2	2	No	Yes	Yes
Heiman et al., (2015)	1	2	2	2	N/A	N/A	N/A	2	2	2	2	2	2	2	Yes	Yes	Yes
Holfeld et al., (2019)	2	2	2	2	N/A	N/A	N/A	1	1	2	2	0	2	2	Yes	Yes	No
Kuo et al., (2014)	2	2	2	2	N/A	N/A	N/A	1	1	2	2	2	2	2	No	Yes	No
Lin et al., (2024)	2	2	2	2	N/A	N/A	N/A	1	2	2	2	2	2	2	Yes	No	No
Marsh et al., (2022)	2	2	2	2	N/A	N/A	N/A	2	2	2	2	1	2	2	Yes	Yes	Yes
Mazurek (2013)	2	2	2	2	N/A	N/A	N/A	2	2	2	2	0	2	2	Yes	Yes	No
Mikami et al., (2015)	2	2	2	2	N/A	N/A	N/A	2	2	2	2	2	2	2	Yes	Yes	Yes
Tuncturk et al., (2023)	2	2	1	2	N/A	N/A	N/A	2	2	2	2	0	2	2	Yes	Yes	Yes
van der Aa et al., (2016)	2	2	1	2	N/A	N/A	N/A	1	2	2	2	0	2	2	Yes	Yes	No
van Schalkwyk et al., (2017)	2	2	1	2	N/A	N/A	N/A	1	2	2	2	1	2	2	Yes	Yes	No
Wright (2017)	2	2	2	2	N/A	N/A	N/A	2	2	2	2	1	2	2	Yes	Yes	Yes

Study	Standard Quality Assessment Criteria for Evaluating Primary Research Papers (Kmet et al., 2004)														Extra Quality Measures		
	(i) Research question	(ii) Study design	(iii) Subject selection	(iv) Participant characteristics	(v) Random allocation	(vi) Investigator blinding	(vii) Participant blinding	(viii) Well defined measures	(ix) Sample size	(x) Analysis	(xi) Variance	(xii) Confounds	(xiii) Results	(xiv) Conclusions	Effect Size	SC/ SD	SM
Wright (2018)	2	2	2	2	N/A	N/A	N/A	2	2	2	2	1	2	2	Yes	Yes	Yes
Wright & Wachs (2019)	2	2	2	2	N/A	N/A	N/A	1	2	2	2	1	2	2	Yes	No	Yes
Yen et al., (2014)	2	2	1	2	N/A	N/A	N/A	1	2	2	2	2	2	2	Yes	No	Yes

Note. SC = social connectedness, SD = social disconnectedness, SM = social media, N/A = not applicable.

Appendix 5

Ethical Approval Letter

RESEARCH AND INNOVATION SERVICES

UCL

Alice Potter
Division of Psychology and Language Sciences
Faculty of Brain Sciences
UCL

Cc: Dr Marc Tibber

07 March 2024

Dear Alice,

Notification of Ethical Approval

Project ID: 26671/001
Title: Exploring the potential benefits of social media in an autistic adult population, and the association with online social connection, online masking, and self-esteem

I am pleased to confirm that your study has been ethically approved by the UCL Research Ethics Committee (UCL REC) until **31 March 2025.**

Ethical approval is subject to the following conditions:

Notification of Amendments to the Research
Please seek the Chair's approval for proposed amendments (to include extensions to duration) to the research for which this approval has been given. Each research project is reviewed separately and if there are significant changes to the research protocol you should seek confirmation of continued ethical approval by completing an 'Amendment Approval Request Form' https://www.ucl.ac.uk/research-ethics/responsibilities-after-approval

Adverse Event Reporting – Serious and Non-Serious
It is your responsibility to report to the REC any unanticipated problems or adverse events involving risks to participants or others. The REC should be notified of all serious adverse events via the Research Ethics Service (ethics@ucl.ac.uk) immediately after the incident occurs. Where the adverse incident is unexpected and serious, the Chair will decide whether the study should be terminated pending the opinion of an independent expert.

For non-serious adverse events, the Chair should again be notified via the Research Ethics Service within ten days of the incident occurring and provide a full written report that should include any amendments to the participant information sheet and study protocol. The Chair will confirm that the incident is non-serious and report to the REC at the next meeting. The final view of the REC will be communicated to you.

Research Ethics Service
Research and Innovation Services
University College London
ethics@ucl.ac.uk
www.ucl.ac.uk/research-ethics/

Final Report
At the end of the data collection element of your research we ask that you submit a very brief report (1–2 paragraphs will suffice) which includes issues relating to the ethical implications of the research (i.e. any issues obtaining consent, participants withdrawing from the research, confidentiality, protection of participants from physical and mental harm etc).

In addition, please:

- ensure that you follow all relevant guidance as laid out in UCL's Code of Conduct for Research;
- note that you are required to adhere to all research data/records management and storage procedures agreed as part of your application. This will be expected even after completion of the study.

With best wishes for the research.

Yours sincerely

[redacted]

Professor Sarah Edwards
Chair, UCL Research Ethics Committee

Research Ethics Service
Research and Innovation Services
University College London
ethics@ucl.ac.uk
www.ucl.ac.uk/research-ethics/

Appendix 6

Participant Information Sheet and Online Survey

Participant Information Sheet for Autistic Adults

UCL Research Ethics Committee Approval ID Number: 26671/001

Title of Study: Exploring the potential benefits of social media in an autistic adult population, and the association with online social connection, online masking, and self-esteem.

Department: Research Department of Clinical, Educational, and Health Psychology

Name and Contact Details of the Researcher(s): Alice Potter – alice.potter.22@ucl.ac.uk

Name and Contact Details of the Principal Researcher: Dr Marc Tibber – m.tibber@ucl.ac.uk

Invitation Paragraph

We would like to invite you to participate in a study on online social connection, masking and self-esteem in autistic adults. Please take time to decide whether or not you wish to take part. You should only participate if you want to; choosing not to take part will not disadvantage you in any way. Before you decide whether you want to take part, it is important for you to understand why the research is being done and what participation will involve. Please take time to read the following information carefully and discuss it with others if you wish. You can contact the researchers by email if anything is not clear, if you have questions, or if you would like more information about the study. You can also contact the researchers with any queries or concerns related to this study after completion. Thank you for reading this.

This study will involve completing a series of questionnaires. Examples of the themes that the survey will explore include online and offline social connection,

online and offline masking, and self-esteem. Examples of survey items include: ‘I feel disconnected from the world around me’, ‘In social situations, I feel like I’m pretending to be “normal”’, and ‘On the whole, I am satisfied with myself’. It will require no more than 25 minutes of your time.

If you do decide to take part, you will be asked to sign a consent form. Even after agreeing to take part, you can still withdraw at any time and without giving a reason, simply by closing your browser.

What is the project’s purpose?

This project explores how social media use is related to wellbeing in autistic adults. In particular, we are exploring if using social media can harness benefits through providing, social connection, decreasing masking, and in turn, improving self-esteem. We hope that this will help our understanding of how autistic people use the social media, and what benefits may be available.

For the purpose of this study, we are interested in social networking sites as a specific sub-set of social media. Social networking sites are online platforms where people can create profiles, share content, and interact with others. We will use the term social media throughout the study.

Can I participate?

We would like to invite you to participate in the study if you are an adult (18 years or over) with a formal diagnosis of autism (e.g. diagnosed by a psychologist, psychiatrist, or speech and language therapist) or are self-identifying as/do not have a formal diagnosis of autism, who typically uses at least one social media platform at least once a day, who has sufficient knowing of English to engage with the survey, and are a UK resident.

Do I have to take part?

It is up to you to decide whether or not to take part. Being involved in this research is entirely voluntary. If you decide to take part, you will be asked to sign a consent form. You can withdraw at any time without giving a reason during the study, and ask for your data to be removed from the study up to one month after participation.

What will happen to me if I take part?

If you decide to take part in this study, you will first be asked to fill in a consent form. Then, if you consent to take part in the study, you will be asked to complete an online survey. Once you have completed the study, if you wish, you will be entered into a prize draw for your participation. There are 8 prizes of £20 (shopping vouchers).
You will also be contacted to ask if you would like to participate in a follow-up study approximately three to six months after the first. Once again, you will be under no obligation to participate in this (second) part of the study.
All data will be collected and stored in accordance with the Data Protection Act 2018 and the General Data Protection Regulation. In addition to the survey responses, we will ask for some limited personal information (e.g. name, surname, email address, age, ethnicity, gender). These will be stored separately from your survey responses, and will not appear in any publications to emerge from the research.

What are the possible disadvantages and risks of taking part?

There are no foreseeable discomforts, disadvantages and risks for taking part. However, some of the questionnaire items will be related to your wellbeing. For example, an item from the survey, “at times, I think I am no good at all”. This it may lead you to connect with difficult thoughts and feelings e.g. relating to loneliness. If you feel uncomfortable at any time during the study, you are free to withdraw at any

time. If you feel that you are affected by any of the issues raised in the questionnaire, or if you are concerned about your mental health, please follow the advice below:

What should I do if I am concerned about my own safety?

Call 999 or go to your local A&E. This can be located at: https://www.nhs.uk/service-search/other-services/Accident-and-emergency-services/LocationSearch/428

What should I do if I feel like I just need to talk to someone (day or night)?

Call 116 123 for the Samaritans, or email: jo@samaritans.org for a reply within 24 hours.

Text "SHOUT" to 85258 to contact the Shout Crisis Text Line.

What should I do if I need urgent mental health support, but it's not an emergency?

If you have already been given a Crisis Team number to use, ring this number.

Otherwise, contact your local urgent mental health helpline, which can be located at: https://www.nhs.uk/service-search/mental-health/find-an-urgent-mental-health-helpline

Alternatively, **call 111** and you will be directed to the appropriate service.

During working hours, you can also book an urgent appointment with your local GP.

What should I do if I would like to access mental health support, but it is not urgent?

Book an appointment with your GP. They will be able to refer or signpost you to appropriate services.

For further information on available mental health support, visit: https://www.nhs.uk/using-the-nhs/nhs-services/mental-health-services/how-to-access-mental-health-services/

For ideas and strategies about how to cope during a crisis, please visit: https://www.mind.org.uk/need-urgent-help/what-can-i-do-to-help-myself-cope/

For support and information related to autism, please visit the National Autistic Society**:** https://www.autism.org.uk/

What are the possible benefits of taking part?

Whilst there are no immediate benefits for those people participating in the project, your involvement in this study will help further our understanding of how autistic people use social media. Through understanding these processes, our eventual hope it to create resources, supports and guidelines to help people flourish in the online world. If you would like, you will also be entered into a prize draw (detailed above).

What if something goes wrong?

If you are unhappy with anything about the study, please contact the Principal Researcher (Dr Marc Tibber). If you feel your complaint has not been handled to your satisfaction, you can contact the Chair of the UCL Research Ethics Committee – ethics@ucl.ac.uk

Will my taking part in this project be kept confidential?

All the information that we collect about you during the course of the research will be kept strictly confidential and in line with regulatory requirements of the Data Protection Act (2018) and General Data Protection Regulation (GDPR, 2018). Your data will be stored securely and held pseudonymously. Basic personal information

(name, contact details, age, gender, ethnicity, autism diagnosis, mental health diagnoses) collected will be stored securely on UCL Data SafeHaven. Identifying information (name, email address) will be kept separate from other data in a password protected database, with data pseudonymised and linked across databases using a unique identifier code for each participant. The document linking participant study IDs to personally-identifiable data will be kept on the UCL SafeHaven. You will not be able to be identified in any ensuing reports or publications.

Limits to confidentiality

Confidentiality will be respected subject to legal constraints and professional guidelines. Confidentiality may be limited and conditional and the researcher has a duty of care to report to the relevant authorities possible harm/danger to the participant or others.

What will happen to the results of the research project?

The results of the study will be presented in a Clinical Psychology doctorate thesis, which will be made publicly available via the UCL Thesis Library. Hopefully, the results of the study will also be published in scientific journals, but you will not be identifiable from such publications. The researcher also hopes to share findings with relevant organisations involved in supporting the wellbeing and mental health of autistic adults, and links to emerging publications shared on social media.

The data will be collected and stored in accordance with the General Data Protection Regulation and the Data Protection Act 2018. All data will be stored on password protected databases. All data are treated as confidential, and your responses will not be linked to any identifiable information. The data will be retained indefinitely in fully anonymised form (i.e., minus identifying information) for the purposes of future

research. These data may also be made publicly available (in fully anonymised form) for other researchers at the time of publication. The data will be disposed of in a secure manner.

Local Data Protection Privacy Notice

Notice: The controller for this project will be University College London (UCL). The UCL Data Protection Officer provides oversight of UCL activities involving the processing of personal data, and can be contacted at data-protection@ucl.ac.uk

Your personal data will be processed for the purposes outlined in this notice.

This 'local' privacy notice sets out the information that applies to this particular study. Further information on how UCL uses participant information can be found in our 'general' privacy notice:

For participants in research studies, click here

The information that is required to be provided to participants under data protection legislation (GDPR and DPA 2018) is provided across both the 'local' and 'general' privacy notices.

The categories of personal data used will be as follows:

Name

Surname

Email address

Age

Gender

Ethnicity

Autism diagnosis information (formally diagnosed or self-identifying/not formally diagnosed, age of diagnosis, service/professional providing diagnosis i.e., NHS, private)

Mental health diagnoses

The lawful basis that would be used to process your *personal data* will be performance of a task in the public interest.

The lawful basis used to process *special category personal data* will be for research purposes.

Your data may be kept indefinitely in fully anonymised form. Identifiable data will be deleted once the study is closed and data have been anonymised for analysis.

If you are concerned about how your personal data is being processed, or if you would like to contact us about your rights, please contact UCL in the first instance at data-protection@ucl.ac.uk.

Who is organising and funding the research?

This research is supported by UCL Research Department of Clinical, Educational, and Health Psychology.

Contact for further information

You can request a copy of the information sheet by contacting the research team.

If you would like more information, please contact:

Researcher: Alice Potter – alice.potter.22@ucl.ac.uk

Principal Researcher: Dr Marc Tibber – m.tibber@ucl.ac.uk

Thank you for reading this information sheet and for considering to take part in this research study.

Online Survey

Full set of survey items for Online Social Connectedness Scale, Camouflaging Autistic Traits Online Questionnaire, Rosenberg Self-Esteem Scale, Social Connectedness Scale-Revised, and Camouflaging Autistic Traits Questionnaire

Online Social Connectedness Scale

Following are a number of statements that reflect various ways in which we view ourselves online. Rate the degree to which you agree or disagree with each statement using the following scale (1 = Strongly Disagree, 2 = Disagree, 3 = Mildly Disagree, 4 = Mildly Agree, 5 = Agree, and 6 = Strongly Agree). There is no right or wrong answer. Do not spend too much time with any one statement and do not leave any unanswered. We understand that some questions may not fit perfectly with your experience, so please select the closest option. At the end of each questionnaire, there is an opportunity to add any additional comments.

(i) I feel comfortable in the presence of strangers online

(ii) I am in tune with the online world

(iii) Even among my online friends, there is no sense of brother/sisterhood

(iv) I fit in well to new situations online

(v) I feel close to people online

(vi) I feel disconnected from the online world around me

(vii) Even around people I know online, I don't feel that I really belong

(viii) I see people online as friendly and approachable

(ix) I feel like an outsider online

(x) I feel understood by the people I know online

(xi) I feel distant from people online

(xii) I am able to relate to my peers online

(xiii) I have little sense of togetherness with my peers online

(xiv) I find myself actively involved in people's lives online

(xv) I catch myself losing a sense of connectedness with society online

(xvi) I am able to connect with other people online

(xvii) I see myself as a loner online

(xviii) I don't feel related to most people online

(xix) My online friends feel like family

(xx) I don't feel like I participate with anyone or any group online

Please use the space below to add any additional comments to your answers that you might want to provide. There is no obligation to do so however.

Camouflaging Autistic Traits Online Questionnaire

Please read each statement below and choose the answer that best fits your experiences during social interactions online (1 = Strongly Disagree, 2 = Disagree, 3 = Somewhat Disagree, 4 = Neither Agree nor Disagree, 5 = Somewhat Agree, 6 = Agree, 7 = Strongly Agree.) There is no right or wrong answer. Do not spend too much time with any one statement and do not leave any unanswered. We understand that some questions may not fit perfectly with your experience, so please select the closest option. At the end of each questionnaire, there is an opportunity to add any additional comments.

(i) I copy facial expressions, body language, or ways of dressing from people whose social media profiles I like

(ii) I monitor the way I present myself on social media profiles so that I appear relaxed

(iii) I rarely feel the need to put on an act on my social media profiles

(iv) I have developed scripts to follow on social media for when I post content or engage in online conversations

(v) I will repeat phrases on social media that I have seen others write or say

(vi) On social media I feel that I'm 'performing' rather than being myself

(vii) In my interactions on social media, I use phrases that I have learned from reading other people interacting

(viii) I always think about the impression I make on other people on social media

(ix) I need support of other people in order to socialise on social media

(x) I enjoy using social media because I do not have to give eye-contact if I don't want to

(xi) I have to force myself to use social media to socialise or interact with others

(xii) I have watched others on social media to improve my social skills

(xiii) I use social media as a resource to learn how I would like to behave or look

(xiv) I carefully monitor how I come across when posting content on social media

(xv) I use social media to avoid interacting with others offline

(xvi) I feel free to be myself when I am on social media

(xvii) Using social media is a way for me to rest from physical social interactions

(xviii) On social media I do not worry about how I come across to other people

(xix) I mainly use social media to browse other people's profiles

(xx) Using social media is a good way for me to practice how to behave in social situations

(xxi) I browse other people's profiles to copy some of the things they do or wear

(xxii) When talking to other people on social media, I feel the chat flows naturally

(xxiii) I enjoy using social media because I can carefully manage my image by controlling how I look or what I say

(xxiv) On social media, I do not pay attention to the way I may be perceived by others

(xxv) On social media, I feel like I am pretending to be 'normal'

Please use the space below to add any additional comments to your answers that you might want to provide. There is no obligation to do so however.

Rosenberg Self-Esteem Scale

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 Disagree = 1, Disagree = 2, Agree = 3, Strongly Agree = 4). There is no right or wrong answer. Do not spend too much time with any one statement and do not leave any unanswered. We understand that some questions may not fit perfectly with your experience, so please select the closest option. At the end of each questionnaire, there is an opportunity to add any additional comments.

(i) On the whole, I am satisfied with myself

(ii) At times I think I am no good at all

(iii) I feel that I have a number of good qualities

(iv) I am able to do things as well as most other people

(v) I feel I do not have much to be proud of

(vi) I certainly feel useless at times

(vii) I feel that I'm a person of worth, at least on an equal plane with others

(viii) I wish I could have more respect for myself

(ix) All in all, I am inclined to feel that I am a failure

(x) I take a positive attitude toward myself

Please use the space below to add any additional comments to your answers that you might want to provide. There is no obligation to do so however.

Social Connectedness Scale-Revised

Following are a number of statements that reflect various ways in which we view ourselves. Rate the degree to which you agree or disagree with each statement using the following scale (1 = Strongly Disagree, 2 = Disagree, 3 = Mildly Disagree, 4 = Mildly Agree, 5 = Agree, and 6 = Strongly Agree). There is no right or wrong answer. Do not spend too much time with any one statement and do not leave any unanswered. We understand that some questions may not fit perfectly with your experience, so please select the closest option. At the end of each questionnaire, there is an opportunity to add any additional comments.

(i) I feel comfortable in the presence of strangers

(ii) I am in tune with the world

(iii) Even among my friends, there is no sense of brother/sisterhood

(iv) I fit in well to new situations

(v) I feel close to people

(vi) I feel disconnected from the world around me

(vii) Even around people I know, I don't feel that I really belong

(viii) I see people as friendly and approachable

(ix) I feel like an outsider

(x) I feel understood by the people I know

(xi) I feel distant from people

(xii) I am able to relate to my peers

(xiii) I have little sense of togetherness with my peers

(xiv) I find myself actively involved in people's lives

(xv) I catch myself losing a sense of connectedness with society

(xvi) I am able to connect with other people

(xvii) I see myself as a loner

(xviii) I don't feel related to most people

(xix) My friends feel like family

(xx) I don't feel like I participate with anyone or any group

Please use the space below to add any additional comments to your answers that you might want to provide. There is no obligation to do so however

Camouflaging Autistic Traits Questionnaire

Please read each statement below and choose the answer that best fits your experiences during social interactions (1 = Strongly Disagree, 2 = Disagree, 3 = Somewhat Disagree, 4 = Neither Agree nor Disagree, 5 = Somewhat Agree, 6 = Agree, 7 = Strongly Agree.) There is no right or wrong answer. Do not spend too much time with any one statement and do not leave any unanswered. We understand that some questions may not fit perfectly with your experience, so please select the closest option. At the end of each questionnaire, there is an opportunity to add any additional comments.

(i) When I am interacting with someone, I deliberately copy their body language or facial expressions

(ii) I monitor my body language or facial expressions so that I appear relaxed

(iii) I rarely feel the need to put on an act in order to get through a social situation

(iv) I have developed a script to follow in social situations

(v) I will repeat phrases that I have heard others say in the exact same way that I first heard them

(vi) I adjust my body language or facial expressions so that I appear interested by the person I am interacting with

(vii) In social situations, I feel like I'm 'performing' rather than being myself

(viii) In my own social interactions, I use behaviours that I have learned from watching other people interacting

(ix) I always think about the impression I make on other people

(x) I need the support of other people in order to socialise

(xi) I practice my facial expressions and body language to make sure they look natural

(xii) I don't feel the need to make eye contact with other people if I don't want to

(xiii) I have to force myself to interact with people when I am in social situations

(xiv) I have tried to improve my understanding of social skills by watching other people

(xv) I monitor my body language or facial expressions so that I appear interested by the person I am interacting with

(xvi) When in social situations, I try to find ways to avoid interacting with others

(xvii) I have researched the rules of social interactions to improve my own social skills

(xviii) I am always aware of the impression I make on other people

(xix) I feel free to be myself when I am with other people

(xx) I learn how people use their bodies and faces to interact by watching television or films, or by reading fiction

(xxi) I adjust my body language or facial expressions so that I appear relaxed

(xxii) When talking to other people, I feel like the conversation flows naturally

(xxiii) I have spent time learning social skills from television shows and films, and try to use these in my interactions

(xxiv) In social interactions, I do not pay attention to what my face or body are doing

(xxv) In social situations, I feel like I am pretending to be 'normal'

Please use the space below to add any additional comments to your answers that you might want to provide. There is no obligation to do so however.

Appendix 7

Table 3

Cronbach's Alpha Total Scale Scores

Scale	Number of Items	Cronbach's Alpha (α)
Online SCS-R	20	0.94
Online CAT-Q	25	0.88
RSES	10	0.88
SCS-R	20	0.93
CAT-Q	25	0.91

Table 4

Cronbach's Alpha Individual Item Scores

OSCS-R		SCS-R		CATO-Q		CAT-Q		RSES	
Item	Cronbach's Alpha (α)	Item	Cronbach's Alpha (α)	Item	Cronbach's Alpha (α)	Item	Cronbach's Alpha (α)	Item	Cronbach's Alpha (α)
1	0.942	1	0.929	1	0.873	1	0.904	1	0.862
2	0.941	2	0.930	2	0.873	2	0.901	2	0.865
3	0.940	3	0.929	3	0.875	3	0.904	3	0.871
4	0.940	4	0.929	4	0.873	4	0.903	4	0.880
5	0.937	5	0.925	5	0.873	5	0.904	5	0.866
6	0.939	6	0.925	6	0.871	6	0.900	6	0.865
7	0.938	7	0.927	7	0.872	7	0.901	7	0.867
8	0.938	8	0.929	8	0.876	8	0.900	8	0.882
9	0.937	9	0.926	9	0.876	9	0.903	9	0.858
10	0.938	10	0.928	10	0.882	10	0.906	10	0.861
11	0.936	11	0.925	11	0.879	11	0.903	-	-
12	0.939	12	0.928	12	0.873	12	0.909	-	-
13	0.938	13	0.928	13	0.871	13	0.903	-	-
14	0.939	14	0.927	14	0.873	14	0.902	-	-
15	0.941	15	0.927	15	0.878	15	0.900	-	-
16	0.937	16	0.926	16	0.886	16	0.906	-	-
17	0.937	17	0.927	17	0.886	17	0.904	-	-
18	0.938	18	0.927	18	0.880	18	0.910	-	-
19	0.939	19	0.928	19	0.879	19	0.904	-	-
20	0.938	20	0.928	20	0.876	20	0.902	-	-
-	-	-	-	21	0.872	21	0.902	-	-
-	-	-	-	22	0.886	22	0.908	-	-
-	-	-	-	23	0.875	23	0.902	-	-
-	-	-	-	24	0.880	24	0.906	-	-
-	-	-	-	25	0.872	25	0.901	-	-

Appendix 8

Table 5

Test of Systematic Differences Between Analytic (N = 274) and Incomplete (N = 54) Samples for Categorical Variables

Variable		χ^2 (df)	*p*
Gender (Male, Female, all other categories)	Male, Female, all other categories	1.35 (2)	.508
Ethnicity (White, all other categories)	White, all other categories	0.01 (1)	.909
Nature of autism diagnosis	Formally diagnosed, Self-identifying	0.17 (1)	.685
Mental health diagnosis	Yes, No	0.29 (1)	.591

Table 6

Test of Systematic Differences Between Analytic (N = 274) and Incomplete (N = 54) Samples for Continuous Variables

Variable	Mean (*SD*)		*t*	df	*p*
	Complete	Incomplete			
Age	39.20 (13.28)	38.17 (12.51)	0.53	326	.597
Average daily social media use (minutes)	131.44 (112.52)	161.54 (158.13)	-1.67	326	.096
Number of social media platforms	3.04 (1.52)	3.20 (1.55)	-0.74	326	.462
Passive/active social media use	5.20 (2.92)	4.94 (2.80)	0.60	326	.548

Appendix 9

Table 7

Final Multivariate Regression Analysis Showing the Regression of Self-Esteem on Key Predictors and Covariates for Analyses Run Without Outliers

Predictor		Multivariate – With All Covariates			Multivariate – With All Covariates			Multivariate – With All Covariates		
		Coefficient (95% CIs)	*SE*	*p*	Coefficient (95% CIs)	*SE*	*p*	Coefficient (95% CIs)	*SE*	*p*
Online social connectedness		0.03 (-0.00, 0.07)	0.02	.059	-	-	-	-0.08 (-0.22, 0.06)	0.07	.239
Online masking		-	-	**-**	-0.06 (-0.09, -0.02)	0.02	**.002**	-0.11 (-0.20, -0.02)	0.05	**.022**
Interaction (online social connectedness*online masking)		-	-	-	-	-	-	0.00 (-0.00, 0.00)	0.00	.120
Offline social connectedness		0.18 (0.15, 0.22)	0.02	**< .001**	-	-	**-**	0.18 (0.14, 0.21)	0.02	**< .001**
Offline masking		-	-	-	-0.07 (-0.11, -0.04)	0.02	**< .001**	-0.00 (-0.04, 0.03)	0.02	.871
Age		0.06 (0.02, 0.10)	0.02	**.003**	-0.01 (-0.06, 0.04)	0.03	.805	0.04 (-0.00, 0.09)	0.02	.055
Gender	Female	-0.98 (-2.23, 0.27)	0.64	.124	-0.04 (-1.53, 1.45)	0.76	.956	-0.69 (-1.95, 0.57)	0.64	.279
	All other genders	-1.48 (-3.28, 0.32)	0.91	.106	-1.15 (-3.25, 0.96)	1.07	.284	-1.33 (-3.13, 0.47)	0.91	.146
Level of social media use		0.00 (-0.01, 0.01)	0.00	.916	0.00 (-0.01, 0.01)	0.00	.829	0.00 (-0.01, 0.01)	0.00	.912
Nature of autism diagnosis	Self-identifying	0.38 (-1.45, 2.20)	0.93	.686	0.20 (-1.93, 2.34)	1.08	.853	0.31 (-1.50, 2.12)	0.92	.733

Note. N = 271. Values in bold indicate significant predictors. Reference groups for categorical predicters were (in brackets) as follows: gender (male), nature of autism diagnosis (formally diagnosed). CI = confidence intervals, SE = standard error.

Appendix 10

Table 8

Outcomes From Assumption Testing for Regression Analyses

Model	Variable	Tests of Normality				Test of Homoscedasticity		Test of Multicollinearity
		Skewness and kurtosis		Shapiro Wilk		Breusch-Pagan		Variance inflation factor (VIF)
		Chi value	*p*	*W* statistic	*p*	Chi-statistic	*p*	Mean VIF value
Full analytic sample *(N* = 274)	OSCS-R	4.05	.132	0.99	.224	1.48	.224	1.35
	CATO-Q	1.65	.437	1.00	.507			1.38
	SCS-R	1.17	.558	1.00	.471			1.54
	CAT-Q	13.33	**< .001**	0.98	**< .001**			1.56
Outliers removed *(N* = 271)	OSCS-R	4.05	.132	0.99	.208	0.41	.523	1.36
	CATO-Q	1.74	.418	1.00	.543			1.30
	SCS-R	0.96	.618	1.00	.480			1.56
	CAT-Q	2.43	.296	0.99	.071			1.51

Note. Values in bold indicate significance.

Appendix 11

Table 9

Demographic Statistics for Incomplete Sample (N = 54)

Demographic Variable			*N* (%)	Mean (*SD*)	Range
Age		-	-	38.17 (12.51)	18-68
Gender	Male		10 (18.52)	-	-
	Female		38 (70.37)	-	-
	Nonbinary		5 (9.26)	-	-
	Prefer not to say		1 (1.85)	-	-
Ethnicity	White		48 (88.89)	-	-
	Mixed or multiple ethnic groups		2 (3.70)	-	-
	Black British, Caribbean, or African		2 (3.70)	-	-
	Other ethnic group		1 (1.85)	-	-
	Prefer not to say		1 (1.85)	-	-
Nature of autism diagnosis	Formally diagnosed		50 (92.59)	-	-
	Self-Identifying		4 (7.41	-	-
Age of autism diagnosis		-	-	33.88 (13.97)	6-64
Diagnostic Service	NHS		27 (54.00)	-	-
	Private		19 (38.00)	-	-
	Private via NHS Right to Choose		3 (6.00)	-	-
	University		1 (2.00)	-	-
Mental health diagnoses	Yes		31 (57.41)	-	-
	No		23 (42.59)	-	-
Mental health reported diagnoses	Depression		19 (35.19)	-	-
	Anxiety (not specified)		19 (35.19)	-	-
	Generalised anxiety		6 (11.11)	-	-
	Panic		1 (1.85)	-	-
	Social anxiety		4 (7.41)	-	-
	OCD		2 (3.70)	-	-
	PTSD		1 (1.85)	-	-
	Complex PTSD		7 (12.96)	-	-
	Eating disorder		3 (5.56)	-	-
	Personality disorder		1 (1.85)	-	-
	Other		2 (3.70)	-	-
Average daily use of social media (minutes)		-	-	161.54 (158.13)	3-960
Number of social media platforms		-	-	3.20 (1.55)	1-9
Passive/active social media use		-	-	4.94 (2.80)	0-10

Note. OCD = obsessive compulsive disorder, PTSD = post-traumatic stress disorder.

Appendix 12

Table 10

Summary Statistics for Scales (N = 274)

Variable	Minimum	Maximum	Mean (*SD*)
OSCS-R	27	115	70.71 (18.17)
CATO-Q	40	159	103.41 (22.38)
RSES	0	29	13.96 (5.52)
SCS-R	20	103	58.39 (16.92)
CAT-Q	48	173	125.47 (21.23)

Appendix 13

Table 11

Demographic Statistics for Full Analytic Sample (N = 274)

Demographic Variable		*N* (%)	Mean (*SD*)	Range
Age	-	-	39.20 (13.28)	18-72
Gender	Male	66 (24.09)	-	-
	Female	170 (62.04)	-	-
	Nonbinary	31 (11.31)	-	-
	Prefer not to say	4 (1.46)	-	-
	Other	3 (1.09)	-	-
Ethnicity	White	245 (89.42)	-	-
	Asian or Asian British	10 (3.65)	-	-
	Mixed or multiple ethnic groups	9 (3.28)	-	-
	Black British, Caribbean, or African	8 (2.92)	-	-
	Other ethnic group	1 (0.36)	-	-
	Prefer not to say	1 (0.36)	-	-
Nature of autism diagnosis	Formally diagnosed	249 (90.88)	-	-
	Self-identifying	25 (9.12)	-	-
Age of Autism Diagnosis	-	-	32.74 (15.88)	1-69
Diagnostic Service	NHS	138 (55.42)	-	-
	Private	83 (33.33)	-	-
	Private via NHS Right to Choose	11 (4.42)	-	-
	School	4 (1.61)	-	-
	Other	6 (2.41)	-	-
	Did not specify	7 (2.81)	-	-
Mental health diagnoses	Yes	168 (61.31)	-	-
	No	106 (38.69)	-	-
Mental health reported diagnoses	Depression	94 (34.31)	-	-
	Anxiety (not specified)	88 (32.12)	-	-
	Generalised anxiety	31 (11.31)	-	-
	Panic	6 (2.19)	-	-
	Social anxiety	6 (2.19)	-	-
	OCD	16 (5.84)	-	-
	PTSD	17 (6.20)	-	-
	Complex PTSD	19 (6.93)	-	-
	Eating disorder	12 (4.38)	-	-
	Personality disorder	9 (3.28)	-	-
	Bipolar	6 (2.19)	-	-
	Other	20 (7.30)		
Average daily use of social media (minutes)	-	-	131.44 (112.52)	1.5-690
Number of social media platforms	-	-	3.04 (1.52)	1-10

Passive/active social media use	-	-	5.20 (2.92)	0-10

Note. OCD = obsessive compulsive disorder, PTSD = post-traumatic stress disorder.

Appendix 14

Table 12

Group Comparisons on Key Study Variables Between Passive and Active Social Media Users

Variable		Passive Users Mean (*SD*)	Active Users Mean (*SD*)	Test Statistic	*p*
OSCS-R		61.93 (16.29)	80.57 (14.84)	*t*(272) = -9.86	**< .001**
CATO-Q		106.14 (22.64)	100.35 (21.76)	*t*(272) = 2.15	**.032**
SCS-R		55.26 (16.70)	61.90 (16.53)	*t*(272) = -3.30	**.001**
CAT-Q		127.03 (22.15)	123.72 (20.08)	*t*(272) = 1.29	.199
Age (years)		28.06 (12.63)	40.50 (13.91)	*t*(272) = -1.52	.129
Gender	Male	25.52% (*N* = 37)	22.48% (*N* = 29)		
	Female	62.76% (*N* = 91)	61.24% (*N* = 79)	X^2 = 1.31	.520
	All other genders	11.72% (*N* = 17)	16.28% (*N* = 21)		
Level of social media use		111.28 (105.08)	154.11 (116.63)	*t*(272) = -3.20	**.002**

Note. Passive users: *N* = 145, active users: *N* = 129. Values in bold indicate significant predictors.

Appendix 15

Table 13

Final Multivariate Regression Analysis Showing the Regression of Self-Esteem on Online Social Connectedness and Other Predictors for Post-Hoc Sensitivity Analyses

		Formally Diagnosed Multivariate – With All Covariates			Passive Social Media Users Multivariate – With All Covariates			Active Social Media Users Multivariate – With All Covariates		
Predictor		Coefficient (95% CIs)	*SE*	*p*	Coefficient (95% CIs)	*SE*	*p*	Coefficient (95% CIs)	*SE*	*p*
Online social connectedness		0.04 (0.01, 0.08)	0.02	**.027**	0.05 (-0.01, 0.11)	0.03	.094	0.04 (-0.02, 0.09)	0.03	.182
Offline social connectedness		0.18 (0.15, 0.22)	0.02	**< .001**	0.19 (0.13, 0.24)	0.03	**< .001**	0.18 (0.13, 0.23)	0.02	**< .001**
Age		0.06 (0.01, 0.10)	0.02	**.009**	0.07 (0.01, 0.14)	0.03	**.020**	0.06 (0.00, 0.11)	0.03	**.037**
Gender	Female	-1.11 (-2.41, 0.19)	0.66	.095	-0.85 (-2.64, 0.95)	0.91	.353	-0.88 (-2.73, 0.97)	0.94	.348
	All other genders	-2.07 (-4.00, -0.16)	0.97	**.034**	0.28 (-2.44, 3.00)	1.37	.840	-2.80 (-5.28, -0.32)	1.25	**.027**
Level of social media use		0.00 (-0.01, 0.01)	0.00	.964	-0.00 (-0.01, 0.01)	0.00	.757	0.00 (-0.01, 0.01)	0.00	.679
Nature of autism diagnosis	Self-identifying	-	-	-	0.86 (-1.88, 3.59)	1.38	.536	-0.37 (-2.96, 2.23)	1.31	.780

Note. Outliers removed from analyses. Values in bold indicate significant predictors. Reference groups for categorical predicters were (in brackets) as follows: gender (male), nature of autism diagnosis (formally diagnosed). CI = confidence intervals, SE = standard error.

Table 14

Final Multivariate Regression Analysis Showing the Regression of Self-Esteem on Online Masking and Other Predictors for Post-Hoc Sensitivity Analyses

		Formally Diagnosed Multivariate – With All Covariates			Passive Social Media Users Multivariate – With All Covariates			Active Social Media Users Multivariate – With All Covariates		
Predictor		Coefficient (95% CIs)	*SE*	*p*	Coefficient (95% CIs)	*SE*	*p*	Coefficient (95% CIs)	*SE*	*p*
Online masking		-0.06 (-0.10, -0.03)	0.02	**.001**	-0.06 (-0.10, -0.01)	0.03	**.030**	-0.06 (-0.11, -0.01)	0.03	**.014**
Offline masking		-0.07 (-0.10, -0.03)	0.02	**.001**	-0.06 (-0.11, -0.00)	0.03	**.034**	-0.09 (-0.14, -0.04)	0.02	**< .001**
Age		-0.01 (-0.06, 0.05)	0.03	.760	-0.00 (-0.08, 0.08)	0.04	.975	-0.02 (-0.09, 0.05)	0.04	.556
Gender	Female	-0.13 (-1.71, 1.45)	0.80	.870	-0.06 (-2.27, 2.16)	1.12	.961	0.11 (-1.98, 2.20)	1.06	.915
	All other genders	-1.37 (-3.64, 0.89)	1.15	.234	-0.33 (-2.97, 3.62)	1.66	.845	-2.59 (-5.37, 0.18)	1.40	.067
Level of social media use		-0.00 (-0.01, 0.01)	0.00	.965	-0.00 (-0.01, 0.01)	0.01	.692	0.00 (-0.01, 0.01)	0.00	.764
Nature of autism diagnosis	Self-identifying	-	-	-	0.73 (-2.58, 4.04)	1.68	.663	-0.63 (-3.52, 2.25)	1.46	.665

Note. Outliers removed from analyses. Values in bold indicate significant predictors. Reference groups for categorical predicters were (in brackets) as follows: gender (male), nature of autism diagnosis (formally diagnosed). CI = confidence intervals, SE = standard error.

Table 15

Final Multivariate Regression Analysis Showing the Regression of Self-Esteem on Online Social Connectedness, Online Masking, the Interaction Term, and Other Predictors for Post-Hoc Sensitivity Analyses

Predictor		Formally Diagnosed Multivariate – With All Covariates			Passive Social Media Users Multivariate – With All Covariates			Active Social Media Users Multivariate – With All Covariates		
		Coefficient (95% CIs)	*SE*	*p*	Coefficient (95% CIs)	*SE*	*p*	Coefficient (95% CIs)	*SE*	*p*
Online social connectedness		-0.07 (-0.21, 0.08)	0.07	.379	-0.27 (-0.50, -0.04)	0.12	**.025**	0.13 (-0.12, 0.38)	0.13	.317
Online masking		-0.10 (-0.20, -0.01)	0.05	**.036**	-0.20 (-0.33, -0.08)	0.06	**.002**	0.03 (-0.17, 0.23)	0.10	.758
Interaction (online social connectedness*online masking)		0.00 (-0.00, 0.00)	0.00	.187	0.00 (0.00, 0.01)	0.00	**.007**	-0.00 (-0.00, 0.00)	0.00	.382
Offline social connectedness		0.18 (0.14, 0.22)	0.02	**< .001**	0.19 (0.13, 0.24)	0.03	**< .001**	0.17 (0.11, 0.22)	0.03	**< .001**
Offline masking		0.01 (-0.03, 0.04)	0.02	.642	-0.00 (-0.05, 0.04)	0.02	.868	-0.01 (-0.06, 0.05)	0.03	.783
Age		0.04 (-0.01, 0.09)	0.02	.102	0.07 (0.01, 0.13)	0.03	**.034**	0.02 (-0.04, 0.08)	0.03	.568
Gender	Female	-0.86 (-2.18, 0.46)	0.67	.200	-0.66 (-2.44,1.12)	0.90	.465	-0.63 (-2.50, 1.23)	0.94	.503
	All other genders	-1.89 (-3.82, 0.04)	0.98	.055	0.58 (-2.06, 3.22)	1.34	.665	-3.35 (-5.84, -0.85)	1.26	**.009**
Level of social media use		0.00 (-0.01, 0.01)	0.00	.971	-0.00 (-0.01, 0.01)	0.00	.638	0.00 (-0.00, 0.01)	0.00	.429
Nature of autism diagnosis	Self-identifying	-	-	-	0.75 (-1.92, 3.41)	1.35	.580	-0.26 (-2.85, 2.34)	1.31	.845

Note. Outliers removed from analyses. Values in bold indicate significant predictors. Reference groups for categorical predicters were (in brackets) as follows: gender (male), nature of autism diagnosis (formally diagnosed). CI = confidence intervals, SE = standard error.