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Towards clearer formulation of adult Autism Spectrum Disorder: exploring comorbidity and measurement.

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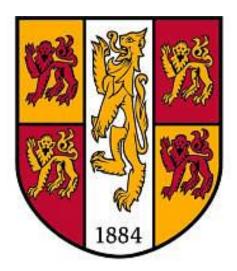
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Towards clearer formulation of adult Autism Spectrum Disorder: exploring comorbidity and measurement.

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PRIFYSGOL BANGOR UNIVERSITY

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Clinical Psychology

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Thesis Abstract

This thesis comprises three papers, aiming to explore the overlap between Autism Spectrum Disorder (ASD) and Borderline Personality Disorder (BPD) and explore the development of a new measure of camouflaging behaviour.

The first paper consists of a literature review examining the connections and comparisons to be made between ASD and BPD. In total, 11 studies met the inclusion criteria and consisted of case studies and quasi-experimental studies. In line with prior research, shared features were noted between the conditions – emotional recognition and regulation difficulties, interpersonal issues and self-injurious behaviour. Rates of comorbidity were found to vary. Condition specific profiles were also explored and the importance of recognising comorbid individuals as a high risk group was identified. Research and clinical implications are discussed.

The second paper describes an empirical research study investigating the development of an original measure of camouflaging behaviour. 247 participants, recruited online, completed questionnaires pertaining to autistic traits and traits of social anxiety, and a proposed measure of camouflaging behaviour – the Conscious Social Strategies Questionnaire (CSSQ). Exploratory factor analysis revealed a four factor measure comprising masking strategies, avoidance strategies, an absence of strategies and compensatory strategies. Significant gender differences were also found. Strengths and limitations of the study are explored.

The final discussion paper suggests developing current clinical guidance, regarding assessment and intervention of ASD and BPD to prevent misdiagnosis and promote the consideration of comorbid diagnoses. In addition, detailed suggestions for future research and theory development are discussed, including qualitative approaches to exploring ASD and its overlap with mental health conditions. Further studies to validate the CSSQ are also explored. To conclude the paper, my personal reflections on completing this thesis are discussed.

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The overlap between Autism Spectrum Disorder and Borderline Personality Disorder – a

review.

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Abstract

Difficulties with emotional regulation, interpersonal relationships and empathy, in Borderline Personality Disorder (BPD), have been noted to occur in Autism Spectrum Disorders (ASD). These similarities in presentation have been proposed to lead to diagnostic uncertainty, with misdiagnosis in clinical settings, as well as increased psychopathology for comorbid individuals. The current review aimed to summarise evidence highlighting the overlap between the two conditions, focusing on issues around misdiagnosis, patterns of comorbidity and specific symptomatic signatures in ASD, BPD and comorbid populations. Comprehensive literature searches were completed across three databases: Web of Science, PubMed and PsycINFO, resulting in 11 papers eligible for review. Findings confirmed significant parallels in symptomology between the two conditions, with higher levels of psychopathology seen in comorbid individuals, particularly suicidality. Comorbidity prevalence rates varied, suggesting a need for controlled epidemiological studies. Subtle differences in specific characteristics were found between groups. Clinical implications include raising awareness within psychiatric and specialist diagnostic settings of the similarities between the two conditions and conducting detailed assessments - with developmental histories and measures relating to personality, interpersonal functioning and executive functioning, in order to be fully comprehensive.

Keywords: Autism Spectrum Disorder (ASD); Borderline Personality Disorder (BPD); misdiagnosis; comorbidity

Lay Summary

Certain thoughts and behaviours seen in Borderline Personality Disorder (BPD) can also be seen in Autism Spectrum Disorders (ASD). This review suggests these similarities can mean that professionals may overlook one condition in favour of the other. People with both conditions may also be more negatively affected than those with just one. Suggestions for developing clinical practice and future research are discussed.

Introduction

There is a small but developing body of literature looking at the similarities and differences between borderline personality disorder (BPD) and autism spectrum disorder (ASD). Whilst many clinicians and researchers have independently noted a phenomenological overlap between these concepts, no systematic reviews on the existing research have been carried out. The purpose of this review is therefore to summarise the research on the shared aspects between BPD and ASD and discuss implications for future research and clinical practice.

Definitions and Prevalence

The *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*; American Psychiatric Association (APA), 2013) characterises Autism Spectrum Disorder (ASD) by the presence of social and communication difficulties, restricted and/or repetitive behaviours and abnormal sensory sensitivity. The *DSM-5* moves on from the *DSM-IV-TR* (American Psychiatric Association (APA), 2000) 4th ed., text rev., noting that ASD encompasses three disorders previously specified - autistic disorder, Asperger's disorder, and part of pervasive developmental disorder not otherwise specified (PDD-NOS). *DSM-5* also specifies that social communication disorder covers the remainder of PDD-NOS (APA, 2013). In this review, several studies are referenced which use the *DSM-IV-TR* (2000) 4th ed., text rev. criteria. As such, the meaning of the term ASD in this review corresponds to the set of three disorders outlined previously - autistic disorder, Asperger's disorder and PDD-NOS. The prevalence for ASD has been estimated at 1% in adult populations (Brugha et al., 2011).

Borderline Personality Disorder (BPD) is characterised by instability in interpersonal relationships, self-image and affect; with marked impulsivity (APA, 2013). Recurrent suicidal behaviours, gestures or threats and self-injurious behaviour are common, as is intense episodic

dysphoria and difficulty in controlling anger. Changes to the diagnostic criteria for BPD were proposed from *DSM-IV-TR* (2000) 4th ed., text rev. to DSM-5 (2013), in terms of specifying impairments in personality functioning for both oneself and interpersonally, and the presence of specific pathological personality traits (APA, 2013). However these changes caused considerable debate and ultimately the original diagnostic criteria were retained. As such this review refers to the original criteria. The alternative criteria proposed are included in Section III of the DSM-5, for further study (APA, 2013). BPD has been found to have a lifetime prevalence of 5.9 % (Grant et al., 2008).

Common Themes across Previous Research

Both ASD and BPD have long been noted to have phenomenological similarities (Pelletier, 1998; Fitzgerald, 2005), with regard to difficulties in interpersonal relationships, affect instability, identity problems, impulsivity, and self-injurious and suicidal behaviours. Much of the research in the past 20 years has reflected this, investigating deficits and difficulties in several areas common to both ASD and BPD independently, including aspects of social cognition and executive function such as theory of mind, mentalising and empathy. Underlying these are emotional recognition and regulation, which impact upon executive functions and interpersonal functioning.

With regard to emotion recognition, impairments have been implicated in both disorders. It is well established that difficulty in identifying and understanding emotional facial expressions is a core feature of ASD (Harms et al., 2010). Eack et al. (2015) examined patterns of impaired facial emotion perception in 45 adults with ASD (without accompanying intellectual disability) and 30 age and gender matched controls. Results showed that people with ASD were significantly more impaired in accuracy and speed at identifying facial expressions of emotion

than when compared to controls. The ASD sample were also significantly more likely than controls to attribute negative valence to neutral faces and mistake happy faces as neutral faces. These findings suggest a potential negative bias toward the interpretation of facial expressions, which has also been implicated in individuals with BPD. A review by Domes et al. (2009) discussed behavioural studies that have shown impairments in basic emotion recognition, a bias towards negativity and a heightened sensitivity to the detection of negative emotions, in individuals with BPD.

Meehan et al. (2017) investigated whether traits of BPD affected the ability to recognise neutral and negative emotional expressions at varying intensities, in a non-clinical sample (N=132). They found that greater traits of BPD were linked to decreased accuracy in detecting neutral faces, but increased accuracy in detecting negative emotion faces. It was also noted that levels of self-regulation, termed 'effortful control' moderated this effect, i.e. for participants with low but not high effortful control, greater borderline personality traits were linked to misattributing emotion to neutral facial expressions, and enhanced detection of low-intensity emotional expressions. Therefore, good self-regulatory skills may protect against social-cognitive deficits.

A lack of self-regulatory skills is arguably a core feature of clinically significant ASD and BPD. If one has difficulty in identifying and processing one's own and others' emotions, it follows that regulating one's emotional responses will also be challenging. Additionally, it has been proposed that individuals from both populations are biologically predisposed to have altered emotion processing. It has been suggested that people with BPD are emotionally sensitive from birth (Crowell et al., 2009), with neurobiological research identifying structural and functional changes in the neural emotion processing pathways in these individuals (Schulze

et al., 2016). Similarly, a meta-analysis of individuals with ASD also found significant functional differences in emotion processing areas of the brain (Aoki et al., 2015).

Given the evidence that individuals with ASD and those with BPD have difficulties in emotion recognition and potential biological differences in emotion processing, they may be more likely to be at risk of further socio-cognitive vulnerability, i.e. emotional dysregulation - the inability to flexibly respond to and manage emotions. If the development of self-regulatory skills is impaired due to differences in emotion processing, it could lead to interpersonal difficulties, particularly in the context of negative affect. Indeed, reviews of emotion dysregulation in both ASD and BPD independently, suggest that deficits in emotional regulation are a risk factor for increased psychopathology, including self-injury (Carpenter & Trull, 2013; Mazefsky & White, 2014).

These reviews note that poor emotional regulation can be influenced by genetic susceptibilities, heightened baselines of emotional or physiological arousal and atypical neurocognitive processes. Similar impairments can therefore be seen in both ASD and BPD with regard to social cognition. Altered social perception may in turn affect other neuropsychological abilities, such as theory of mind, empathy and mentalising, with deficits in the ability to identify others' mental states, and to predict others' behaviour based on their mental states. Being less able to interpret other's intentions and views, alongside a bias towards sensing negative emotions, could lead to greater affective instability and a strong desire for immediate relief from this. Difficulties in interpreting one's own emotions, particularly at these times, could also circumvent the use of appropriate coping strategies and/or lead to the development of potentially maladaptive self-regulatory strategies. Socio-cognitive difficulties could therefore

lead to an impaired ability to adaptively cope with relationships, greater emotional disturbances, impulsive, and self-injurious behaviours.

Self-injurious and suicidal behaviours have been investigated in both ASD and BPD, with researchers suggesting these behaviours may serve different functions in the two populations. It has been proposed that for those with ASD, self-injurious behaviour is linked to sensory overload (Duerden et al., 2012), and is generally not shared with others. In those with BPD, it may serve as an escape from emotional and interpersonal difficulty (Carpenter & Trull, 2013; Zanarini et al., 2013), and serve as a care-eliciting behaviour. Nonetheless, a self-regulatory component is indicated in both populations.

With regards to suicidality, recent research has indicated a potential risk factor when ASD and BPD features overlap. Chabrol and Raynal (2018) examined the overlap of BPD and ASD traits in 474 non-clinical adults. They identified four groups – one with high levels of ASD traits and BPD traits together, a high BPD traits group, a high ASD traits group and a low traits group. They found that the group with combined traits experienced significantly greater suicidal ideation than individuals with high levels of BPD traits, despite similar levels of depressive symptoms. The individuals with high levels of BPD traits also experienced greater suicidal ideation than the high ASD traits group and low traits group. The researchers propose that a combination of ASD and BPD traits could account for these results e.g. hypersensitivity to stress in ASD and emotional hyper-reactivity in BPD may create more frequent episodes of intense negative affect, provoking more suicidal ideation. Given these findings in a non-clinical population, it is of particular import to be aware of whether clinical populations could be similarly affected by comorbidity between ASD and BPD.

When considering the common themes across previous research, a link between ASD and BPD seems plausible, with researchers noting that an overlap between the two disorders could cause issues of diagnostic confusion, particularly in adult psychiatric settings (Pelletier, 1998; Fitzgerald, 2005), with ASD being generally diagnosed in childhood, whilst BPD is typically diagnosed in late adolescence to early adulthood. Previous reviews of diagnostic issues regarding ASD in adults, note a high rate of psychiatric comorbidity, with comorbidity rates of up to 70% (Lenhardt et al., 2013).

Takara et al. (2015) suggest that aspects of BPD could mask autistic features and lead to misdiagnosis of individuals with ASD, noting that both groups were susceptible to stressful situations, with intense anger, interpersonal difficulties and self-injury making diagnosis challenging. They also highlighted that both ASD and BPD populations have higher incidences of childhood abuse than healthy controls, which could further contribute to emotional dysregulation and similar presentations in adulthood. Similarly, Smith (2013) speculated that individuals with subthreshold autistic traits and a history of childhood trauma could be more likely to receive a diagnosis of BPD. He notes that empathy difficulties could be implicated in both ASD and BPD, with diagnostic outcomes influenced by the severity of these difficulties and the presence or absence of childhood maltreatment.

Given the previous research around common themes across both disorders, it is important to understand how BPD and ASD overlap and differ, to allow for clinicians to make a comorbid or differential diagnosis. This could prevent over-diagnosis of ASD or BPD, or misdiagnosing comorbidity due to diagnostic overshadowing. This is especially important in the context of potentially increased suicidality for comorbid cases. Therefore this review aims to summarise

evidence discussing the diagnostic issues, patterns of comorbidity, and overlapping characteristics and psychopathology of ASD and BPD.

Methods

Inclusion and Exclusion Criteria

Inclusion criteria specified papers published in English, focusing on participant samples aged above 16 years. Papers were included if they investigated ASD and BPD with an ASD, BPD, or comorbid ASD and BPD sample. Only papers published from 2008 onwards were reviewed in order to capture the most recent literature, which is within the recommended guidelines of 5-10 years for undertaking a review (Cronin et al., 2008). Studies were excluded if participants were aged under 16 years old, focused specifically on neurobiology and/or genetics, and if they did not sample or specifically reference ASD or BPD populations.

Search Strategy

Papers for review were identified systematically. PsycINFO, PubMed and Web of Science were searched in February 2018. Search terms used consisted of the following combinations: 'Personality disorder OR borderline personality disorder OR BPD OR Cluster B AND autis* OR Asperger* OR autism spectrum disorder OR ASD'. Finally, both authors examined the citations and references of the selected papers, with no further eligible studies identified.

Search Outcome

Running these search combinations resulted in 1812 results across the three identified databases. After duplicates were removed, 884 titles and abstracts were screened and reviewed. 21 full-text papers were then read and examined for suitability. Based on the above criteria, 11

papers were selected for review, published between January 2008 and January 2018 (see Appendix A).

Results

Article Characteristics

Three studies were conducted in Sweden, two in Italy, and one each from Germany, the Netherlands, Spain, Sweden and France jointly, the UK and the USA. With regards to study design, two of the 11 papers included for review were case reports, and nine were quasi-experimental studies. Four studies included a typically developing (TD) control group for comparison. All studies looked at individuals without intellectual disability, or assumed this to be the case. Sample sizes ranged from 3 to 2744.

Article Themes

The 11 studies that met criteria are organised thematically into three broad categories, in order to coherently present findings: issues around misdiagnosis, investigations into comorbidity, and specific characteristics and psychopathology. Two papers illustrated case examples of misdiagnosis of ASD with reference to BPD, six looked at patterns of comorbidity with regard to either ASD or BPD populations and three investigated specific psychopathological characteristics in both populations. Studies reviewed are marked with a * in the reference list. A summary table of the papers reviewed can be seen in Appendix B.

Issues around misdiagnosis

Luciano et al. (2014) discuss 12 cases of adults with 'high-functioning' ASD who were previously misdiagnosed with other psychiatric conditions, outlining the reasons for misdiagnosis in each case. One case relevant to this review will be focused upon; a 23 year old female (F) who was diagnosed with BPD, Obsessive Compulsive Disorder (OCD), Social

Phobia and an Eating Disorder Not Otherwise Specified (EDNOS) earlier in her history, before being diagnosed with ASD.

The authors outline F's history, with reference to her difficulties initially becoming apparent whilst she was in her first year of university. She struggled to attend her university lectures and exams, experienced episodes of binge-eating and vomiting, and self-injurious behaviour. She was initially directed to an Eating Disorder service by a relative - a psychiatrist. This had little effect - F attempted suicide and was referred to an Adult Mental Health Service. Her self-injurious behaviour continued, and she was given the diagnoses listed above. Both medication and psychotherapy were ineffective and F attempted suicide once again. F obtained her ASD diagnosis following her own internet research and being directed to an ASD service via this.

The researchers note that taking a detailed developmental history was the critical factor in making the diagnosis of ASD, discussing that F's social and communication difficulties and sensory sensitivities, had been present since early childhood. F appeared to enjoy her own company, not seeking out other children to play with, and had only one friend. She had never been able to tolerate physical contact and disliked going to university lectures because of her longstanding preference for physical space around her. In addition, she had never understood implied gestures and innuendos, such as winking, and decoded facial expressions from watching cartoons and having her mother help her.

The reasons for misdiagnosis in F's case were discussed as three-fold. Firstly, it was suggested that other psychiatric labels were more acceptable to F's relatives, with behaviours concerning interpersonal difficulties being perceived to be a less valid reason to seek professional guidance in Italy. Secondly, the authors note that highly specialised clinics may not have adequate knowledge of ASD and therefore may not consider this as part of a differential diagnosis. Finally, they suggest that people with 'high-functioning' ASD, may appear more clinically

confusing to professionals as several features of this type of ASD can overlap with those of other clinical disorders e.g. poor emotional control, and that these individuals present with average intelligence and verbal fluency.

It is interesting to note that the researchers discuss that the diagnosis of ASD explains all features of F's presentation and promote the use of a differential rather than comorbid diagnosis. Whilst ASD could be an underlying cause for F's interpersonal and emotional difficulties, the possibility and potential value of a comorbid diagnosis is not discussed. This could be of importance given F's history of suicide attempts and the finding that higher suicidality is indicated in non-clinical populations with both ASD and BPD traits (Chabrol & Raynal, 2018), As such, this may be relevant for those with 'high-functioning' ASD, who the authors posit are individuals on the extreme end of a normal distribution of autistic-like traits.

Trubanova et al. (2014) outlined three case reports of women attending higher education (Brigitte, 18; Carina, 20; Jan, 26) who had experienced a delayed diagnosis of ASD, proposing that gender can play a role in the under-identification of ASD. They posit that women with ASD (without accompanying intellectual impairment) tend to show an atypical ASD symptom presentation, emotion regulation difficulties and heightened comorbidities including BPD traits, all of which cause diagnostic confusion and consequently a delay in appropriate support and treatment.

All three women interviewed expressed traditional ASD traits atypically. Firstly, the women displayed cognitive rigidity and an insistence on sameness, but that this was not immediately apparent to others as disordered. For example, all the women struggled to accept alternative explanations for events and other's behaviour. Whilst two of them could conceive of alternative explanations in a structured setting, they were unable to apply these to real life situations. For

example, Brigitte could conceive of situational reasons why a person might be late, in a structured setting. However, she stated that she was never late because she was a considerate person, and therefore her friends were always late because they were inconsiderate. Secondly the women displayed a marked degree of social ambivalence, either avoiding unstructured and unfamiliar social situations completely, being or being motivated to seek out friendships based on resources e.g. Carina wanted to be friends with a roommate in case she ever got locked out and needed an extra key or with her academic peers in case she ever got stuck with homework.

Finally, the researchers discussed that all the women had interpersonal difficulties often demonstrating uncommon ideas of what reciprocal friendship entailed. For example, Brigitte stated that all her friends were 'liars' or 'selfish' and that all people were like this. She also described beliefs that her friends were taking advantage of her and only spent time with her when they needed something. Carina described frequently 'testing' the quality of her friendships with specific rules e.g. counting how many times she had interacted with someone per month. Jan identified friendships with two women who were 20-30 years older than her, one of which was closely involved with her academic training, stating that they were friends because they had spoken on the phone several times and she had visited their houses at times of crisis.

Additionally, emotion recognition and regulation difficulties were discussed by the researchers. They note that Brigitte and Carina appeared to have flattened affect and a need to 'upregulate' emotionally. Brigitte acknowledged hiding her emotions and expressed a desire for acting classes to increase the animation in her voice. Carina consistently denied experiencing emotions in distressing situations and stated she was driven by logic rather than emotion. In

contrast, Jan appeared to have a need to 'downregulate' showing heightened affect during emotional difficulties.

The interpersonal and emotional difficulties highlighted above, overlap markedly with those of individuals with BPD. All the women interviewed exhibited self-damaging behaviour and marked interpersonal difficulties, as well as issues around intense feelings of anger and identity struggles. Brigitte reported that her interpersonal difficulties were due to other people's behaviour and never her own, characteristic of an extreme devaluing of others and anger as consistent with BPD. Carina's friendship testing also involved deliberately not communicating feelings of sadness to others because she was interested to see which of her friends would intuit this, and express concern towards her. She also displayed identity issues – describing herself in specific roles and finding it difficult when she could not fulfil those specific roles. Jan displayed recurrent suicidal and para-suicidal behaviours and intense anger towards others, particularly her parents and professional services.

The researchers suggest that in women there is a heightened comorbidity of internalising disorders with ASD and caution clinicians against diagnostic overshadowing in the presence of such comorbidities. They posit that anxious and depressive symptomatology may combine with the social difficulties of ASD to produce traits characteristic of BPD, such as those outlined above. This supports previous research around emotion recognition and regulation in both ASD and BPD populations, suggesting that the emotional difficulties that the women display are features of both conditions.

Whilst both the above papers have obvious limitations in terms of a lack of generalisability by virtue of their design, these findings are important in highlighting diagnostic issues facing clinicians. In the context of the overlap between ASD and BPD, these papers lend support to

previous findings, highlighting that self-injury, difficulties in emotion recognition and regulation, and interpersonal difficulties can be implicated in both disorders. In addition, both papers discuss that individuals with ASD without accompanying intellectual impairments, are more likely to present in clinically atypical ways, in line with Takara et al. (2015). This could cause diagnostic confusion for professionals and it is therefore important to keep ASD in mind when considering differential and comorbid diagnoses, particularly with regard to women, who may be more likely to present with features of both conditions.

Patterns of Comorbidity

Four studies examined psychiatric comorbidities within ASD populations. Findings differ with regards to the prevalence of BPD in these populations. Ketelaars et al. (2008) conducted a pilot study and sampled adults that had been referred to a specialist autism team, of whom 15 received a diagnosis (12 males, 3 females) and 21 did not – these were used as a comparison group (18 males, 3 females). Following administration of the International Personality Disorder Examination (IPDE, Loranger et al., 1994), it was found that one individual from the ASD group fully met the criteria for BPD (7% of the sample), and one individual from the non-ASD group partially met criteria (5% of the sample). Given the small sample size, the researchers advise caution in terms of drawing definite conclusions. Additionally, large age and gender differences between the two groups were identified, and it is therefore possible that traits of BPD were under-recognised, particularly given that these traits have been suggested to be more prevalent in women (Trubanova et al., 2014).

Hofvander et al. (2009) assessed a larger sample of adults referred to two specialist assessment centres. They found that of 117 participants given diagnoses of an ASD (77 males, 40 females), ten individuals (9% of the total sample) also met criteria for BPD, as assessed by the Structured Clinical Interview for DSM-IV Axis II Personality Disorders (SCID-II, First et al., 1997), a

slightly higher prevalence than as found by Ketelaars et al. (2008). They did not find a significant difference between the number of men and women who met criteria for BPD (5% vs 15% of the total number of men and women respectively) with p = 0.09, however this was the second largest difference reported in rates of personality disorders between men and women, after Schizoid Personality Disorder. Additionally, they did find that 56% of their sample had experienced childhood bullying, and that this was most commonly reported by women ($\chi^2(1) = 6.09$, p = 0.02), which could suggest a link between childhood victimisation and the development of specific personality disorders for women.

Rydén and Bejerot (2008) also assessed individuals referred to a specialist psychiatric clinic. Of the individuals diagnosed with an ASD - 84 non-intellectually disabled adults (45 males, 39 females), over 40% met adjusted cut-off scores for BPD, as assessed by the Structured Clinical Interview Screen for DSM-IV Axis II Personality Disorders (SCID-II Screen, Ekselius et al., 1994). However, this was not significantly different from the 46 individuals who were referred but not diagnosed with ASD, who formed the comparison group (21 males, 25 females), as 37% of this group also met adjusted cut-off scores for BPD. It is important to note that participants in the ASD group met criteria for several personality disorders – the median was four, compared to two in the comparison group. These findings could be due to the fact that a self-report measure – the SCID-II Screen was used rather than the full SCID-II (First et al., 1997). Whilst strong agreement between the screen and the interview has been found previously (Ekselius et al., 1994), more recent research comparing the two in a sample of 496 prisoners, only found moderate agreement between the two methods and stated that the screen is not a substitute for the interview (Ullrich et al., 2008).

A significant difference was found in the ASD group between males and females, with women reporting higher levels of BPD traits, in contrast to Hofvander et al. (2009) and in keeping with

Trubanova et al. (2014), supporting the idea that women with ASD may experience greater overlap with BPD and therefore greater diagnostic uncertainty. Interestingly, 13.5% of the ASD group and 9.1% of the non-ASD group had received a diagnosis of BPD prior to ASD assessment. These findings reinforce prior research discussing potential diagnostic uncertainty for ASD in adult psychiatric settings (Fitzgerald, 2005; Pelletier, 1998) given that these adults were referred for further neurodevelopmental assessment following previous psychiatric diagnoses of BPD.

Contrary to the above studies, Lugnegård et al. (2012) examined 54 participants (26 males, 28 females) with prior diagnoses of ASD and found that none met criteria for BPD, or indeed any Cluster B personality disorders, when assessed with the SCID-II (First et al., 1997). However these findings must be interpreted with caution. The participants in this study were recruited in a markedly different way to the other papers, which could affect results. The authors originally contacted 155 eligible adults of which 35% responded and completed the study, and suggest that those who did not participate may have been more likely to have been individuals with BPD or other poorly represented personality disordered groups, by virtue of their difficulties. Additionally, all participants had already received ASD diagnoses, with 48% of the sample having received their ASD diagnoses as children or adolescents. This suggests that there was a lesser degree of diagnostic uncertainty for these individuals, which could result in underrepresentation of those with comorbidities such as BPD, which can mask ASD features as discussed above. Alternatively, it could suggest that receiving earlier diagnoses and therefore appropriate interventions, could help prevent the development of comorbid BPD.

Two further studies investigated the prevalence of ASD within BPD populations. Rydén et al. (2008) conducted pilot research, assessing 41 females with BPD, who had been referred to a specialist unit. They confirmed diagnoses with the SCID-II (First et al., 1997). Following

clinical interviews, 19 participants were assessed further for suspected ASD, with the Asperger Syndrome Diagnostic Interview (ASDI, Gillberg et al., 2001) and where possible, the Five-to-fifteen (FTF, Kadesjö et al., 2004) or Autism – Tics, Attention Deficit Hyperactivity Disorder and other Comorbidities (A-TAC, Hansson et al., 2005) questionnaires were administered to the participant's parents. Findings were then discussed with an expert clinician. They found that six of the women had ASD (15% of the total sample). However, this figure may be underrepresentative, with nine of the suspected ASD cases not having enough information available to make a diagnosis (either from not having any parental information or the participant being unwilling to participate in further ASD assessment).

In terms of the methodological limitations of this study - the researchers note that using an observational assessment tool such as the ADOS (Lord et al., 2000) could have provided a more robust measure of assessment rather than the measures used. Additionally, use of the FTF was changed to the A-TAC during the study period, meaning that not all cases were assessed in the same manner. Therefore findings must be interpreted with caution.

The researchers also looked at rates of suicidality, splitting the total sample into two groups based on number of suicide attempts – non-frequent or frequent (≥ 5). They found that there was a significant difference between groups with 50% of the BPD and ASD group having 5 or more suicide attempts compared to 5.9% of the BPD without ASD group. However, no significant difference was found between groups on a measure of suicidality – the Suicide Assessment Scale (SUAS, Niméus et al., 2006). Interestingly, participants with ASD scored significantly lower than those without ASD on two subscales of the Structural Analysis of Social Behaviour (SASB, Benjamin, 1996) – self-love and self-control and had significantly lower global functioning as assessed by the Global Assessment of Functioning (GAF, Hall,

1995). This suggests that adults with ASD and BPD represent a particularly affected subgroup of individuals with ASD, with more frequent suicide attempts and greater general impairments, in line with prior research findings.

Dell'Osso et al. (2018) assessed for traits of ASD in 50 adults with BPD and in a control group of 69 typically developing adults. They found that participants with BPD scored significantly more highly on all subscales of the Adult Autism Subthreshold Spectrum (AdAS Spectrum, Dell'Osso et al., 2017) and all but one subscale of the Autism Quotient (AQ, Baron-Cohen et al., 2001) -p < 0.001. They also found that those in the BPD group with a history of physical or sexual abuse (68% of the sample) scored significantly higher on total scores of the AdAS than those without (p = 0.014). Additionally, autistic traits were found to be a predictor of BPD diagnosis, even when controlling for mood symptoms via the Mood Spectrum Self-Report (MOODS-SR, Dell'Osso et al., 2002).

The MOODS-SR (2002) was administered to all participants, with the BPD group scoring significantly higher on all subscales of the MOODS-SR than the control group. Additionally, total scores on the AdAS (2017) were significantly positively correlated with overall suicidality as assessed by six items on the MOODS-SR (r = 0.534, p = 0.038). This supports previous findings suggesting that combined symptomatology of BPD and ASD could increase levels of suicidality (Rydén et al., 2008; Chabrol & Raynal, 2018).

Dell'Osso et al.'s (2018) findings strongly support prior research suggesting a link between subthreshold traits of ASD and a history of maltreatment contributing to a BPD presentation (Smith, 2013). However, the study did not elucidate the direction of causality here, and as such inferences about causal relationships must be interpreted with caution. It is unclear whether the

presence of subthreshold ASD traits potentially made participants more vulnerable to abuse and as such the development of BPD, or whether having experienced abuse led to symptomatology characteristic of ASD e.g. detachment from others, decreased empathy; as well as BPD psychopathology.

The studies reviewed in this category lend support to previous evidence proposing a link between ASD and BPD, highlighting greater diagnostic uncertainty, possible gender effects and increased psychopathology, particularly suicidality, when both conditions are implicated in psychiatric populations. There is considerable variation in comorbidity rates, and the studies reviewed above used small sample sizes and varied considerably in terms of their methodology. Additionally, all but one study did not use a typically developing control group for comparison. It is therefore important to note that without controlled epidemiological studies, prevalence data of BPD in individuals with ASD and vice versa may reflect trends within particular regions at particular times. As such, further research is required.

Specific Characteristics and Psychopathology

Three studies compared particular characteristics in ASD and BPD populations, with the aim of identifying symptomatic signatures in both populations. Strunz et al. (2015) compared personality characteristics and pathology in a sample of 59 adults with ASD (27 males, 32 females) to 80 individuals with BPD (29 males, 51 females), 62 with Narcissistic Personality Disorder (NPD) (45 males, 17 females) and 106 nonclinical controls (56 males, 50 females). In line with prior research (Luciano et al., 2014; Takara et al., 2015), they discuss that individuals with milder ASD may experience greater diagnostic uncertainty and be more prone to misdiagnosis of a personality disorder, amongst other conditions. As such, they sought to

identify patterns of personality that could help differentiate between ASD and BPD populations. For the purpose of this review, the NPD sample will not be discussed.

Using the NEO-Personality Inventory-Revised (NEO-PI-R, Costa & McCrae, 1992) the researchers found that ASD individuals differed significantly on the five personality scales – Neuroticism, Extraversion, Openness for Experience, Agreeableness and Conscientiousness, when compared to those with BPD and controls. The Dimensional Assessment of Personality Pathology – Basic Questionnaire (DAPP-BQ, Livesley & Jackson, 2009) was used to measure personality pathology in the different populations sampled. The four dimensions of the DAPP-BQ relate to the pathological extremes of the characteristics identified by the NEO-PI-R – Emotional Dysregulation to Neuroticism, Dissocial Behaviour inversely to Agreeableness, Inhibitedness inversely to Extraversion and Compulsivity to Conscientiousness.

With regard to Neuroticism and Emotional Dysregulation the researchers found that ASD individuals scored significantly higher on both these dimensions than controls but significantly lower than those with BPD (p > .001 in all cases). This shows that whilst both clinical groups display higher levels of susceptibility to stress and poorer coping than controls, ASD individuals may be more resilient than those with BPD. When looking at the subscales of Neuroticism, it is notable that both ASD and BPD groups did not differ on anxiety or self-consciousness, suggesting an overlapping presentation.

ASD individuals scored significantly lower than BPD individuals on Extraversion, suggesting a more introverted personality profile for those with ASD. In keeping with this, ASD individuals also scored significantly higher on the DAPP-BQ dimension of Inhibitedness than those with BPD and controls. Interestingly, on the subscales of this dimension (intimacy

problems, social avoidance and restricted expression), no significant differences were found between ASD and BPD populations. As above, this finding suggests that outwardly, social difficulties in ASD and BPD can present similarly.

ASD individuals scored significantly lower than BPD and controls on Openness for Experience. However, the researchers discuss that on one subscale - 'Ideas' ASD individuals scored significantly higher than BPD individuals, and not differently from controls. They suggest that this reflects that individuals with ASD are open to experience, but on a predominantly intellectual level. With regard to Agreeableness and Dissocial Behaviour, the researchers found that whilst ASD individuals scored significantly lower than controls on Agreeableness, there was no difference between ASD and BPD populations on this dimension, suggesting that both groups have similar difficulties in trust and consideration of others. However, BPD individuals scored significantly higher than those with ASD on Dissocial Behaviour, who were not significantly different from controls. Notably, ASD individuals scored significantly higher than BPD individuals on Conscientiousness and Compulsivity, displaying a tendency for orderly, precise and organised behaviour.

These findings show that whilst there is overlap in both ASD and BPD groups in terms of personality pathology and characteristics, which could contribute to diagnostic uncertainty, there are also notable differences between the groups, with ASD individuals appearing more conscientious, introverted and compliant than those with BPD. Personality measures could therefore be a potential way of allowing for a differential diagnosis to be made in suspected ASD and BPD populations.

Interpersonal emotion regulation in BPD and ASD populations was looked at by López-Pérez et al. (2017). They compared 30 individuals with ASD, 30 with BPD and 60 age, gender and education matched controls. The researchers posit that there are several types of emotion regulation strategies both adaptive e.g. reframing a negative event positively, and maladaptive e.g. avoidance of negative feelings. They discuss that both ASD and BPD populations display difficulties in emotion regulation with regard to modulating their own affect (intrapersonal emotion regulation), in line with prior research. They note that interpersonal emotion regulation i.e. social sharing of emotional states, strategies undertaken to change others' feelings and modulation of one's own affect through social interaction, may also differ in ASD and BPD populations, with implications for treatment.

The participants completed two measures of interpersonal emotion regulation – the Emotion Regulation of Others and Self (EROS, Niven et al., 2011; Da Costa et al., 2014) and the Interpersonal Emotion Management Scale (IEMS, Little et al., 2012; Da Costa et al., 2014). For the EROS, only the two scales relating to interpersonal emotion regulation were used – extrinsic affect improvement and extrinsic affect worsening – which assess the tendency to deliberately improve or worsen the mood of others. The IEMS examined four types of strategy which help others manage their emotions – situation modification (altering a situation to reduce the emotional impact), attention deployment (directing the target's attention to something positive), cognitive change (reappraising a situation more positively) and suppression (keeping emotions down).

Results found that both individuals with ASD and BPD engaged in significantly less affect improvement than both groups of controls, but did not differ from each other. No significant differences were found for affect worsening. This supports prior research, showing that both

ASD and BPD groups show interpersonal difficulties, with regard to attempting to improve others' moods. Interestingly, all groups except the ASD group engaged in significantly more affect improvement than affect worsening. The authors suggest that those with ASD generally engage less in interpersonal emotional regulation than others, however this finding could also suggest that individuals with ASD engage in affect improvement and worsening to the same degree.

When looking at specific strategies, ASD individuals were found to report significantly less attention deployment and cognitive change, and more suppression to change others' feelings as compared to the BPD group and to controls. No difference was found for situation modification between groups. BPD individuals therefore reported engaging in significantly more adaptive interpersonal emotion regulation strategies than those with ASD. Thus, the researchers suggest that whilst both ASD and BPD populations display difficulties with intrapersonal emotion regulation, ASD individuals may be more impaired with regard to interpersonal emotion regulation.

This study lends support to the notion that socio-cognitive difficulties can lead to impairments in interpersonal functioning for both ASD and BPD populations, as they represent the capacity for correctly identifying others' emotions and the causes of them, which is an established difficulty for both groups. Given that both ASD and BPD populations show interpersonal difficulties with helping others with their emotions as well as their own, interventions targeting this deficit may be useful for these groups e.g. more emphasis could be given on developing adaptive regulation strategies for those with ASD and generally enhancing affect improvement for those with BPD.

The two studies above show notable strengths in including nonclinical control groups, to allow for a more meaningful comparison of psychopathological characteristics, and in discussing specific characteristics in significant levels of detail, which could help make differential diagnoses and have implications for intervention. However, neither study looked at comorbid ASD and BPD populations, who could present with their own distinct personality patterns and emotion regulation strategies and require specialised interventions.

Dudas et al. (2017) examined this, by looking at differences in autistic traits, empathy and systemising (the drive to analyse or build systems) between groups of ASD (313 males, 311 females), BPD (3 males, 20 females), comorbid ASD and BPD (7 males, 9 females) and nonclinical (696 males, 1386 females) participants, in order to better differentiate symptomology between groups. Autistic traits were measured by the Autism Quotient (AQ, Baron-Cohen et al., 2001), Empathy or empathising ability was measured with the Empathy Quotient (EQ, Baron-Cohen & Wheelwright, 2004) and systemising was measured by the Systemising Quotient-Revised (SQ-R, Baron-Cohen et al., 2003; Wheelwright et al., 2006).

Results showed that comorbid individuals reported significantly higher levels of autistic traits than those with ASD, who in turn reported higher levels than those with BPD, who in turn reported higher levels than controls. This supports research indicating that autistic traits are present in those with BPD (Dell'Osso et al., 2018). In terms of empathy, the BPD group did not differ significantly on EQ scores from controls, however both scored significantly higher than the ASD and comorbid groups who also did not differ from each other. This could suggest that ASD is a key factor in driving empathy impairments. The ASD and BPD groups did not differ in terms of systemising, but both showed significantly higher scores than the control

group. The comorbid group was not significantly different to the other groups despite being the highest scoring group.

Given the large discrepancy between group sample sizes, a smaller subset of the full sample was selected in order to replicate results. All the BPD and comorbid individuals were included, with 25 randomly selected individuals from each of the ASD and control groups. Here, the BPD and ASD groups did not differ from one another on AQ scores, however both groups did again score higher than controls. The comorbid group scored significantly higher than the BPD group but did not differ from the ASD group. Results were replicated for EQ scores in the same pattern as the full sample. All clinical groups scored significantly higher than controls for systemising but did not differ significantly from each other, similar to the pattern found in the full sample.

The researchers note the high proportion of females in the BPD sample, and given that levels of autistic traits did not differ significantly in the BPD and ASD groups in the random sample, they suggest that some of these women may well have undiagnosed ASD, in line with prior research. It is interesting to note that this study found an overlap between ASD and BPD groups in terms of systemising. The researchers suggest that systemising could be a common feature of both BPD and ASD, or that systemising could be a way of compensating for emotional instability in BPD. The overlap in clinical features noted by this study therefore provides further evidence for the necessity of careful examination of ASD traits in individuals referred for BPD assessment. Therefore, assessing empathising and systemising may facilitate more accurate diagnosis, allowing for comorbidity to be considered.

Discussion

Summary of Outcomes and Clinical Implications

This review highlighted a number of findings consistent with prior research positing a phenomenological overlap between ASD and BPD. Difficulties with self-injurious behaviour, emotion recognition and regulation, and interpersonal difficulties appear to be implicated in both disorders (Luciano et al., 2014; Trubanova et al., 2014). Comorbidity rates varied, identifying a need for further controlled epidemiological studies. Individuals with overlapping features also appear to face greater diagnostic uncertainty and may be at greater risk of suicidality (Rydén et al., 2008; Dell'Osso, 2018). Potential symptomatic signatures could help distinguish between groups, with subtle differences found in specific personality features and pathology (Strunz et al., 2015), types of interpersonal emotion regulation (López-Pérez et al., 2017) and empathising and systemising abilities (Dudas et al., 2017).

Given the finding that adults with ASD can show emotional and interpersonal difficulties consistent with BPD symptomology and that ASD traits are present and elevated in individuals with BPD, taking steps to enhance diagnostic clarity are paramount. The evidence cautions professionals to be alert to comorbid possibilities, especially in light of the potential for an elevated risk of suicide in this group. Increased training and understanding regarding the overlap in features between both conditions, could help avoid misdiagnosis and raise awareness of comorbidity across mental health and specialist ASD services. Additionally, when assessing for ASD and/or BPD, taking a detailed developmental history to look for when particular difficulties were first noted, and using specific measures to investigate patterns of psychopathology as outlined above, could aid in making differential or comorbid diagnoses. Finally, developing a greater understanding for how best to adapt current therapeutic models and interventions, to fit the specific needs of those with features of both ASD and BPD, could be a useful way forward.

Limitations and Areas for Future Research

The review has a number of limitations. Firstly, the majority of studies reviewed reported small, heterogeneous samples, without accompanying intellectual disability, unbalanced gender representation, and were unmatched with TD controls, limiting generalisability. Cohorts also consisted of individuals with different types of ASD - Autism, Asperger's and PDD-NOS. Whilst these conditions are conceptualised as existing on a spectrum currently, it is important to note that the overlap between ASD and BPD may be subtly different for individuals at different points on the autism spectrum, requiring further exploration. Similar differences may be found when examining ASD and BPD overlap between different genders and those with differing cognitive abilities. Where possible, future studies could therefore include larger, more representative, gender balanced samples, matched with controls.

The narrative approach used in the current review is another potential limitation, however, given the heterogeneity of the studies reviewed, the authors felt that a meta-analysis would be inappropriate. Whilst the papers reviewed varied significantly, and each thematic category covered a small number of papers, the aim was to summarise the most recent information in order to inform current and future clinical practice in this area.

This review only looked at studies sampling those aged 16 and above, as diagnoses of BPD are indicated in late adolescence to early adulthood. Given the potential impact of childhood trauma on the development of features common to both ASD and BPD (Hofvander et al., 2009; Smith, 2013; Dell'Osso et al., 2018) and the resulting diagnostic uncertainty for these individuals, longitudinal studies are required. These could look at developmental trajectories of ASD and BPD symptoms over time, to elucidate the factors influencing the development and/or interplay between features of both conditions. Advances could facilitate earlier

identification and enhance the interventions and support provided for individuals with ASD and indeed their caregivers in younger cohorts.

Finally, this review specifically examined findings relating solely to the potential overlap between ASD and BPD. It can be argued that findings were overlooked with regard to examining the comorbidity of ASD with other personality disorders, given that studies have noted that ASD can overlap with more than one personality disorder. However, by examining multiple personality disorders it becomes difficult to identify specific implications in terms of assessment and treatment for those individuals identified in this review. Further reviews examining the overlap between ASD and other personality disorders could therefore be valuable.

References

- Aoki, Y., Cortese, S., & Tansella, M. (2015). Neural bases of atypical emotional face processing in autism: a meta-analysis of fMRI studies. *The World Journal of Biological Psychiatry*, *16*(5), 291-300.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (DSM-5®)*. American Psychiatric Pub.
- American Psychiatric Association. (2000). Diagnostic and statistical manual of mental disorders (4th ed., text revision). *Washington, DC: American Psychiatric Association*.
- Baron-Cohen, S., Richler, J., Bisarya, D., Gurunathan, N., & Wheelwright, S. (2003). The systemizing quotient: an investigation of adults with Asperger syndrome or high–functioning autism, and normal sex differences. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 358(1430), 361-374.
- Baron-Cohen, S., & Wheelwright, S. (2004). The empathy quotient: an investigation of adults with Asperger syndrome or high functioning autism, and normal sex differences. *Journal of autism and developmental disorders*, 34(2), 163-175.
- Baron-Cohen, S., Wheelwright, S., Skinner, R., Martin, J., & Clubley, E. (2001). The autism-spectrum quotient (AQ): Evidence from asperger syndrome/high-functioning autism, malesand females, scientists and mathematicians. *Journal of autism and developmental disorders*, 31(1), 5-17.
- Benjamin, L. S. (1996). A clinician-friendly version of the Interpersonal Circumplex:

 Structural Analysis of Social Behavior (SASB). *Journal of personality*assessment, 66(2), 248-266.
- Brugha, T. S., McManus, S., Bankart, J., Scott, F., Purdon, S., Smith, J., et al. (2011). Epidemiology of autism spectrum disorders in adults in the community in England. *Archives of general psychiatry*, 68(5), 459-465.

- Carpenter, R. W., & Trull, T. J. (2013). Components of emotion dysregulation in borderline personality disorder: a review. *Current psychiatry reports*, *15*(1), 335.
- Chabrol, H., & Raynal, P. (2018). The co-occurrence of autistic traits and borderline personality disorder traits is associated to increased suicidal ideation in nonclinical young adults. *Comprehensive psychiatry*, 82, 141-143.
- Costa Jr, P. T., & McCrae, R. R. (1992). The five-factor model of personality and its relevance to personality disorders. *Journal of personality disorders*, 6(4), 343-359.
- Costa, S. D., Páez, D., Oriol, X., & Unzueta, C. (2014). Regulación de la afectividad en el ámbito laboral: validez de las escalas de heteroregulación EROS y EIM. Revista de Psicología del Trabajo y de las Organizaciones, 30(1), 13-22.
- Cronin, P., Ryan, F., & Coughlan, M. (2008). Undertaking a literature review: a step-by-step approach. *British journal of nursing*, *17*(1), 38-43.
- Crowell, S. E., Beauchaine, T. P., & Linehan, M. M. (2009). A biosocial developmental model of borderline personality: Elaborating and extending linehan's theory. *Psychological bulletin*, *135*(3), 495.
- Dell'Osso, L., Armani, A., Rucci, P., Frank, E., Fagiolini, A., Corretti, G., et al. (2002).

 Measuring mood spectrum: comparison of interview (SCI-MOODS) and self-report

 (MOODS-SR) instruments. *Comprehensive psychiatry*, 43(1), 69-73.
- *Dell'Osso, L., Cremone, I. M., Carpita, B., Fagiolini, A., Massimetti, G., Bossini, L., et al. (2018). Correlates of autistic traits among patients with borderline personality disorder. *Comprehensive Psychiatry*.
- Dell'Osso, L., Gesi, C., Massimetti, E., Cremone, I. M., Barbuti, M., Maccariello, G., et al. (2017). Adult Autism Subthreshold Spectrum (AdAS Spectrum): Validation of a questionnaire investigating subthreshold autism spectrum. *Comprehensive psychiatry*, 73, 61-83.

- Domes, G., Schulze, L., & Herpertz, S. C. (2009). Emotion recognition in borderline personality disorder—a review of the literature. *Journal of personality disorders*, 23(1), 6-19.
- *Dudas, R. B., Lovejoy, C., Cassidy, S., Allison, C., Smith, P., & Baron-Cohen, S. (2017). The overlap between autistic spectrum conditions and borderline personality disorder. *PloS one*, *12*(9), e0184447.
- Duerden, E. G., Oatley, H. K., Mak-Fan, K. M., McGrath, P. A., Taylor, M. J., Szatmari, P., & Roberts, S. W. (2012). Risk factors associated with self-injurious behaviors in children and adolescents with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 42(11), 2460-2470.
- Eack, S. M., Mazefsky, C. A., & Minshew, N. J. (2015). Misinterpretation of facial expressions of emotion in verbal adults with autism spectrum disorder. *Autism*, *19*(3), 308-315.
- Ekselius, L., Lindström, E., Knorring, L. V., Bodlund, O., & Kullgren, G. (1994). SCID II interviews and the SCID Screen questionnaire as diagnostic tools for personality disorders in DSM-III-R. *Acta Psychiatrica Scandinavica*, 90(2), 120-123.
- First, M. B., Gibbon, M., Spitzer, R. L., & Benjamin, L. S. (1997). *User's guide for the structured clinical interview for DSM-IV axis II personality disorders: SCID-II*.

 American Psychiatric Pub.
- Fitzgerald, M. (2005). Borderline Personality Disorder and Asperger Syndrome. *Autism*, *9*(4), 452.
- Gillberg, C., Gillberg, C., Råstam, M., & Wentz, E. (2001). The Asperger Syndrome (and high-functioning autism) Diagnostic Interview (ASDI): a preliminary study of a new structured clinical interview. *Autism*, *5*(1), 57-66.
- Grant, B. F., Chou, S. P., Goldstein, R. B., Huang, B., Stinson, F. S., Saha, T. D., et al. (2008).

 Prevalence, correlates, disability, and comorbidity of DSM-IV borderline personality

- disorder: results from the Wave 2 National Epidemiologic Survey on Alcohol and Related Conditions. *The Journal of clinical psychiatry*, 69(4), 533.
- Hall, R. C. (1995). Global assessment of functioning: a modified scale. *Psychosomatics*, *36*(3), 267-275.
- Hansson, S. L., Röjvall, A. S., Rastam, M., Gillberg, C., Gillberg, C., & Anckarsäter, H. (2005).

 Psychiatric telephone interview with parents for screening of childhood autism—tics, attention-deficit hyperactivity disorder and other comorbidities (A—TAC): Preliminary reliability and validity. *The British Journal of Psychiatry*, 187(3), 262-267.
- Harms, M. B., Martin, A., & Wallace, G. L. (2010). Facial emotion recognition in autism spectrum disorders: a review of behavioral and neuroimaging studies. *Neuropsychology review*, 20(3), 290-322.
- *Hofvander, B., Delorme, R., Chaste, P., Nydén, A., Wentz, E., Ståhlberg, O., et al. (2009).

 Psychiatric and psychosocial problems in adults with normal-intelligence autism spectrum disorders. *BMC psychiatry*, *9*(1), 35.
- Kadesjö, B., Janols, L. O., Korkman, M., Mickelsson, K., Strand, G., Trillingsgaard, A., et al. (2004). The FTF (Five to Fifteen): the development of a parent questionnaire for the assessment of ADHD and comorbid conditions. *European child & adolescent psychiatry*, *13*(3), 3-13.
- *Ketelaars, C., Horwitz, E., Sytema, S., Bos, J., Wiersma, D., Minderaa, R., et al. (2008). Brief report: Adults with mild autism spectrum disorders (ASD): Scores on the autism spectrum quotient (AQ) and comorbid psychopathology. *Journal of Autism and Developmental Disorders*, 38(1), 176-180.
- Lehnhardt, F. G., Gawronski, A., Pfeiffer, K., Kockler, H., Schilbach, L., & Vogeley, K. (2013). The investigation and differential diagnosis of Asperger syndrome in adults. *Deutsches Ärzteblatt International*, 110(45), 755.

- Little, L. M., Kluemper, D., Nelson, D. L., & Gooty, J. (2012). Development and validation of the interpersonal emotion management scale. *Journal of Occupational and Organizational Psychology*, 85(2), 407-420.
- Livesley, W. J., & Jackson, D. (2009). Manual for the dimensional assessment of personality pathology—basic questionnaire. *Port Huron, MI: Sigma*.
- *López-Pérez, B., Ambrona, T., & Gummerum, M. (2017). Interpersonal emotion regulation in Asperger's syndrome and borderline personality disorder. *British Journal of Clinical Psychology*, *56*(1), 103-113.
- Loranger, A. W., Sartorius, N., Andreoli, A., Berger, P., Buchheim, P., Channabasavanna, S. M., et al. (1994). The international personality disorder examination: The World Health Organization/Alcohol, Drug Abuse, and Mental Health Administration international pilot study of personality disorders. *Archives of General Psychiatry*, *51*(3), 215-224.
- Lord, C., Risi, S., Lambrecht, L., Cook, E. H., Leventhal, B. L., DiLavore, P. C., et al. (2000).

 The Autism Diagnostic Observation Schedule—Generic: A standard measure of social and communication deficits associated with the spectrum of autism. *Journal of autism and developmental disorders*, 30(3), 205-223.
- *Luciano, C. C., Keller, R., Politi, P., Aguglia, E., Magnano, F., & Burti, L. (2014).

 Misdiagnosis of high function autism spectrum disorders in adults: an Italian case series. *Autism Open Access*, 4(131), 2.
- *Lugnegård, T., Hallerbäck, M. U., & Gillberg, C. (2012). Personality disorders and autism spectrum disorders: what are the connections?. *Comprehensive Psychiatry*, *53*(4), 333-340.
- Mazefsky, C. A., & White, S. W. (2014). Emotion regulation: Concepts & practice in autism spectrum disorder. *Child and adolescent psychiatric clinics of North America*, 23(1).

- Meehan, K. B., De Panfilis, C., Cain, N. M., Antonucci, C., Soliani, A., Clarkin, J. F., et al. (2017). Facial emotion recognition and borderline personality pathology. *Psychiatry research*, 255, 347-354.
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & Prisma Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS medicine*, 6(7), e1000097.
- Niméus, A., Ståhlfors, F. H., Sunnqvist, C., Stanley, B., & Träskman-Bendz, L. (2006). Evaluation of a modified interview version and of a self-rating version of the Suicide Assessment Scale. *European Psychiatry*, 21(7), 471-477.
- Niven, K., Totterdell, P., Stride, C. B., & Holman, D. (2011). Emotion Regulation of Others and Self (EROS): The development and validation of a new individual difference measure. *Current Psychology*, *30*(1), 53-73.
- Pelletier, G. (1998). Borderline personality disorder vs. Asperger's disorder. *Journal of the American Academy of Child & Adolescent Psychiatry*, 37(11), 1128.
- *Rydén, E., & Bejerot, S. (2008). Autism spectrum disorder in an adult psychiatric population.

 A naturalistic cross sectional controlled study. *Clinical Neuropsychiatry*, 5(1), 13-21.
- *Rydén, G., Rydén, E., & Hetta, J. (2008). Borderline personality disorder and autism spectrum disorder in females: A cross-sectional study. *Clinical Neuropsychiatry*, *5*(1), 22-30.
- Schulze, L., Schmahl, C., & Niedtfeld, I. (2016). Neural correlates of disturbed emotion processing in borderline personality disorder: a multimodal meta-analysis. *Biological Psychiatry*, 79(2), 97-106.
- Smith, A. (2013). Autism, borderline personality disorder, and empathy. *Emotion Review*, *5*(2), 223-224.
- *Strunz, S., Westphal, L., Ritter, K., Heuser, I., Dziobek, I., & Roepke, S. (2015). Personality pathology of adults with autism spectrum disorder without accompanying intellectual

- impairment in comparison to adults with personality disorders. *Journal of autism and developmental disorders*, 45(12), 4026-4038.
- Takara, K., Kondo, T., & Kuba, T. (2015). How and Why is Autism Spectrum Disorder Misdiagnosed in Adult Patients?-From Diagnostic Problem to Management for Adjustment. *Mental Health in Family Medicine*.
- *Trubanova, A., Donlon, K., Kreiser, N. L., Ollendick, T. H., & White, S. W. (2014). Under-identification of ASD in females: a case series illustrating the unique presentation of ASD in young adult females. *Scandinavian Journal of Child and Adolescent Psychiatry and Psychology*, 2(2), 66-76.
- Ullrich, S., Deasy, D., Smith, J., Johnson, B., Clarke, M., Broughton, N., et al. (2008).

 Detecting personality disorders in the prison population of England and Wales: comparing case identification using the SCID-II screen and the SCID-II clinical interview. *The Journal of Forensic Psychiatry & Psychology*, 19(3), 301-322.
- Wheelwright, S., Baron-Cohen, S., Goldenfeld, N., Delaney, J., Fine, D., Smith, R., et al. (2006). Predicting autism spectrum quotient (AQ) from the systemizing quotient-revised (SQ-R) and empathy quotient (EQ). *Brain research*, 1079(1), 47-56.
- Zanarini, M. C., Laudate, C. S., Frankenburg, F. R., Wedig, M. M., & Fitzmaurice, G. (2013).

 Reasons for self-mutilation reported by borderline patients over 16 years of prospective follow-up. *Journal of personality disorders*, 27(6), 783-794.

Appendix A: PRISMA Diagram.

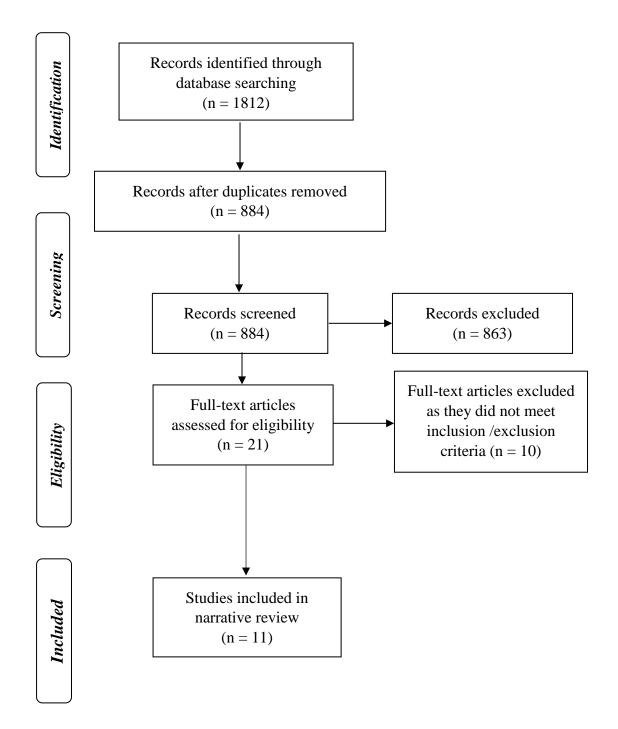


Figure 1. Flow diagram demonstrating selection procedure based on the Preferred Reporting Items for Systematic Reviews and Meta-analyses guidelines (PRISMA; Moher et al., 2009).

Appendix B: Summary table of papers reviewed, organised according to themes.

Theme	Authors (Year and	Participant demographics	Aims and Methodology	Main Findings	Limitations
	Location)				
Issues around	Luciano et al.	<i>N</i> : 12 (9 males, 3	Case reports were obtained from	 Cases of high 	• Small sample size,
misdiagnosis	(2014; Italy)	females) with high	5 specialist ASD centres in	functioning ASD can	with few females,
		functioning ASD.	Italy, to describe emblematic	easily be mistaken for	only 1
		Age range: 18 – 50	examples of adults with high	other psychiatric	misdiagnosed with
		years	functioning ASD who had been	disorders, including	BPD.
		IQ range: 73 – 138	misdiagnosed. All participants	personality disorders.	• Findings may not be
			had the ADOS-4, AQ, EQ,	 Diagnoses can only be 	generalisable to
			WAIS-R, SCID-I and SCID-II	made clear following	other cohorts e.g.
			administered, as well as	taking detailed	those of lower IQ,
			examining DSM-V criteria.	developmental histories	those from other
				and considering all	countries.
				clinical features.	 Comorbidity not
				 Having insufficient 	considered.
				experience of ASD may	• No control group.
				lead to misdiagnosis.	
	Trubanova et al.	N: 3 females	The study aimed to demonstrate	Participants displayed	Small sample size.
	(2014; USA)	diagnosed with	how symptoms of ASD	unique ASD symptom	• Findings may not be
		ASD.	manifest uniquely in females,	manifestation,	generalisable to
			without accompanying	emotional dysregulation	other cohorts e.g.

		Age range: 18 – 26 years IQ range: without co-occurring intellectual impairment.	intellectual impairments. Participants were recruited from a research clinic at a university in the Southeastern United States. ASD diagnoses were confirmed with the ADOS-2.	and heightened psychiatric comorbidities with internalising disorders including BPD traits. These issues may contribute to ASD symptoms in females being under-identified and/or obscured, leading to misdiagnosis or late diagnosis.	males, those of lower IQ. No control group.
Patterns of	Ketelaars et al.	N (ASD Group): 15	The study aimed to investigate	No significant group	Small sample size
Comorbidity	(2008; The	(12 males, 3	whether individuals with mild	differences were found,	• Large age and
	Netherlands)	females).	ASD and those not diagnosed	following Chi-Square	gender differences
		ASD diagnoses:	with ASD differed in terms of	tests.	between groups.
		Asperger: 4; PDD-	AQ-scores and Axis I and II	• 47% of the ASD group	 Findings may not
		NOS: 10; high-	disorders. Participants were	fully or partially met	be generalisable to
		functioning autism:	recruited from specialist ASD	criteria for a	other cohorts e.g.
		1	outpatient centres. ASD	personality disorder, as	those of lower IQ.
		Age range: 18 –	diagnoses were given following	did 48% of the non-	No TD control
		24.5 years	administration of parent	ASD sample.	group.
		IQ: mean - 104	interviews, ADI-R and ADOS-		

	<i>N</i> (control group):	G. The SCAN and IPDE were	•	7% of the ASD sample		
	21 (18 males, 3	used to assess for the presence		fully met criteria for		
	females).	of Axis I and II disorders.		BPD and 5% of the		
	Age range: 18 –			non-ASD sample		
	55.9 years			partially met criteria.		
	IQ: mean – 105					
Hofvander et al.	N: 117 (77 males,	Participants were recruited from	•	62% of the total sample	•	Findings may not be
(2009; Sweden	40 females).	expert diagnostic centres		also met criteria for at		generalisable to
and France)	ASD diagnoses:	specialising in neuropsychiatric		least 1 personality		other cohorts e.g.
	Autistic disorder: 5;	assessments of childhood		disorder. 35% met		those of lower IQ.
	Asperger: 62; PDD-	disorders in adults Autistic		criteria for at least 2 and	•	No control group.
	NOS: 50	symptomatology was assessed		17% met criteria for 3		
	Age range: 16 –	according to the DSM-IV-		or more personality		
	60 years	criteria and the Gillberg and		disorders.		
	IQ: normal	Gillberg research criteria.	•	Men and women did not		
	intelligence	Patterns of comorbid		differ in frequency of		
		psychopathology were		personality disorders		
		examined using the SCID-I and		with the exception of		
		SCID-II. Psychosocial outcomes		Schizoid Personality		
		were also looked at.		Disorder, with more		
				women affected.		
			•	9% of the total sample		
				met criteria for BPD.		

•	5% of males and 15% of
	females met criteria for
	BPD.

Rydén and N (ASD Group): 84 Bejerot (2008; (45 males, 39 Sweden) females). ASD Diagnoses: Autistic disorder: 5: Asperger: 51; PDD-NOS: 28 Age range: not specified, mean 30 years IQ range: ≥ 70 *N* (control group): 46 (21 males, 25 females). Age range: not specified, mean 34 years IQ: ≥ 70

Participants were recruited from psychiatric clinic specialising in assessing and treating adults with neurodevelopmental conditions. Demographic factors, psychiatric comorbidity, and personality traits in outpatients with ASD were compared to a psychiatric control group. The FTF and ASSQ were used to establish ASD diagnoses, alongside parent/carer reports and clinical interviews. The SCID-II Screen was used to examine cooccurrence of personality disorders. Gender differences were also examined within the ASD group.

- People with ASD had significantly more schizotypal and avoidant personality traits.
- Females with ASD scored significantly higher than males on borderline and passiveaggressive traits
- Over 40% of the ASD group met criteria for BPD, as did 37% of the control group.
- 13.5% of the ASD group and 9.1% of the non-ASD group received a diagnosis of BPD prior to ASD assessment.

- Retrospective use of measures not designed for adults.
- Findings may not be generalisable to other cohorts e.g. those of lower IO.
- 'Gold standard' assessments were not administered e.g. the ADOS and ADI-R.
- No TD control group.

Lugnegård et al.	N: 54 adults with	The presence of personality	• 48%	of the sample	•	Only 35% of
(2012; Sweden)	Asperger's	disorders was examined using	fulfi	lled criteria for a		eligible participants
	syndrome (26	the SCID-II. Participants were	perso	onality disorder, all		contacted took part.
	males, 28 females).	recruited from specialist	belo	nging to clusters A	•	Findings may not be
	Age range: not	outpatient centres. 45	or C			generalisable to
	specified, mean 27	individuals had their ASD				other cohorts e.g.
	years	diagnoses confirmed via the				those of lower IQ.
	IQ range: 73 - 143	DISCO.			•	No control group
Rydén et al.	N (BPD and ASD	The study aimed to see whether	• 15%	of the total sample	•	Non-standardised
(2008; Sweden)	group): 6 females	ASD was present in females	had .	ASD alongside		assessment-some
	Age range: not	with BPD, referred to a specific	BPD).		participants had the
	specified, mean	treatment programme. The	• 50%	of the BPD and		FTF and others the
	31.2 years	SCID-II and ZAN-BPD were	ASD	group had 5 or		A-TAC.
	IQ: mean – 98.7	used to assess for BPD. The	more	e prior suicide	•	'Gold-standard'
		WAIS-III was administered to	atter	npts compared to		assessments were
	N (BPD without	all participants. ASD was	5.9%	o of the BPD		not used e.g. the
	ASD group): 35	assessed using clinical	with	out ASD group.		ADOS and ADI-R.
	females	interview, the ASDI, and the	• The	ASD and BPD	•	Small sample size,
	Age range: not	FTF or A-TAC, alongside	grou	p scored		with only females.
	specified, mean	parent report. Clinical outcomes	signi	ificantly lower on	•	Findings may not be
	28.6 years	between groups including self-	meas	sures of self-love		generalisable to
	IQ: mean – 100.1	image (assessed by the SASB),	and s	self-control and had		other cohorts, e.g.
		suicidality (assessed by the				males, those of

Dell'Osso et al. N (BPD Group): 50 The clinical significance of (2018; Italy) (15 males, 35 ASD traits in people with BPD females). Age range: not examined. BPD participants were recruited from three Italian 33.8 years university departments of IQ: without psychiatry. Comorbidities were intellectual assessed using the SCID-5-CV. impairment ASD traits were looked at with the AQ and the AdAS without such a history. N (Control Group): Spectrum. The MOODS-SR females). Age range: not examined mood symptoms and females). Age range: not specified, mean s		SUAS) and general functioning (assessed by the GAF) were also examined.		significantly lower global functioning.	•	lower IQ, those from other countries. No TD control group.
levels of mood	(15 males, 35 females). Age range: not specified, mean 33.8 years IQ: without intellectual impairment N (Control Group): 69 (27 males, 42 females). Age range: not specified, mean	ASD traits in people with BPD and healthy controls was examined. BPD participants were recruited from three Italian university departments of psychiatry. Comorbidities were assessed using the SCID-5-CV. ASD traits were looked at with the AQ and the AdAS Spectrum. The MOODS-SR examined mood symptoms and	•	had significantly higher levels of ASD traits than controls. Participants with BPD with a history of physical or sexual abuse had higher levels of ASD traits than those without such a history. ASD traits were a predictor of BPD diagnosis, even when controlling for mood symptoms. The BPD group had	•	Fewer males than females were in the sample. Direction of causality was not established. Findings may not be generalisable to other cohorts, e.g. those of lower IQ, those from other

		IQ: without		symptoms than the	
		intellectual		control group.	
		impairment	•	ASD traits were	
				significantly positively	
				correlated with overall	
				suicidality.	
Specific	Strunz et al.	N (ASD Group):	ASD participants were recruited	ASD individuals scored •	Groups were
Characteristics	(2015;	59 adults (27 males,	via a specialist outpatient clinic.	significantly higher on	unmatched-BPD
and	Germany)	32 females). ASD	BPD participants were	Neuroticism and	participants were
Psychopathology		Diagnoses:	inpatients recruited from a	Emotional	inpatients, whilst
		Asperger: 49; high-	number of hospitals in	Dysregulation than	ASD participants
		functioning autism:	Germany. Controls were	controls but	were outpatients.
		10	recruited via flyers in local	significantly lower than •	Findings may not be
		Age range: not	papers. The study aimed to	those with BPD.	generalisable to
		specified, mean	identify patterns of personality	ASD participants scored	other cohorts, e.g.
		32.7 years	traits (using the NEO-PI-R) and	significantly lower than	those of lower IQ,
		IQ: without	personality pathology (using the	BPD individuals on	those from other
		accompanying	DAPP-BQ) specific to adults	Extraversion, and	countries.
		intellectual	with ASD without intellectual	significantly higher on	
		impairment	impairments. ASD diagnoses	the Inhibitedness than	
			were established with the	the BPD and control	
			ADOS and the ADI-R, BPD	groups.	
			with the SCID-II.		

N (BPD Group): 80

adults (29 males, 51

females)

Age range: not

specified, mean

29.7 years

IQ: without

accompanying

intellectual

impairment

N (Control

Group): 106 adults

(56 males, 50

females)

Age range: not

specified, mean

30.8 years

IQ: without

accompanying

intellectual

impairment

- ASD individuals scored significantly lower than BPD and controls on Openness for Experience.
- ASD individuals scored significantly lower than controls on Agreeableness, but were not significantly different from the BPD group. BPD individuals scored significantly higher than those with ASD on Dissocial Behaviour.
- ASD individuals scored significantly higher than BPD individuals on Conscientiousness and Compulsivity.

*NPD individuals not described here.

López	-Pérez et	N (ASD Group): 30	The study aimed to examine the	•	Both ASD and BPD	•	Only self-report
al. (20	17;	adults with	use of interpersonal emotion		participants engaged in		measures were
Spain)	1	Asperger's	regulation strategies in ASD and		less affect improvement		used; an
		syndrome (73%	BPD populations, compared to		than controls.		observational
		males, 24%	age, gender and education	•	ASD individuals		measure e.g. diaries
		females)	matched controls. Clinical		reported significantly		of interactions kept
		Age range: 18 - 43	participants were recruited from		less use of adaptive		by observers, could
		years	4 mental health institutions in a		strategies and more		have been helpful.
		IQ: not specifically	large Spanish city. Controls		maladaptive strategies,	•	Findings may not be
		referenced	were sourced from an existing		as compared to the BPD		generalisable to
			participant pool. Participants		group and to controls.		other cohorts, e.g.
		N (Control Group	completed the EROS and IEMS	•	Tailored interventions		those from other
		for ASD): 30 adults	to investigate the extent to		may help target specific		countries.
		(70% males, 30%	which they engaged in		difficulties for ASD and		
		females)	interpersonal emotion regulation		BPD populations.		
		Age range: 18 – 45	and the specific strategies they				
		years	used to do this. The SCID-I and				
		IQ: not specifically	SCID-II were also administered				
		referenced	to all participants.				

	<i>N</i> (BPD Group): 30			
	adults (20% males,			
	80% females)			
	Age range: $18 - 43$			
	years			
	IQ: not specifically			
	referenced			
	N (Control Group			
	for BPD): 30 adults			
	(24% males, 76%			
	females)			
	Age range: $18 - 45$			
	years			
	IQ: not specifically			
	referenced			
Dudas et al.	N (ASD	Autistic traits (as measured by	The comorbid group	Unbalanced sample
(2017; UK)	Group): 624 (313	the AQ), empathy (as measured	displayed higher levels	sizes with
	males, 311 females)	by the EQ) and systemising (as	of autistic traits (higher	unbalanced gender
	Age range: not	measured by the SQ-R) were	AQ scores) than the	distributions.
	specified, mean	examined in ASD, BPD and	ASD group, who in turn	 Diagnoses of BPD
	39.36 years	comorbid populations, alongside	scored higher than the	and comorbidity
		controls. Participants were		

were not formally IQ: not specifically recruited and completed all BPD group, who scored referenced measures, online. higher than controls. confirmed. The comorbid and ASD Only self-report N (BPD Group): 23 groups reported lower measures were (3 males, 20 levels of empathy than used. females) the BPD group, who Age range: not were not different from specified, mean controls. 38.83 years The ASD and BPD IQ: not specifically groups both reported referenced higher levels of systemising than N(ASD + BPD)controls. Group): 16 (7 males, 9 females) Age range: not specified, mean 36.19 years IQ: not specifically referenced N (Control Group): 2081 (696

males, 1386

females)

Age range: not

specified, mean

39.48 years

IQ: not specifically

referenced

Abbreviations: AdAS Spectrum: Adult Autism Subthreshold Spectrum; ADI-R: Autism Diagnostic Interview-Revised; ADOS: Autism Diagnostic Observation Schedule; ADOS-G: Autism Diagnostic Observation Schedule – 2nd Edition; ADOS-4: Autism Diagnostic Observation Scale-Module 4; ASD: Autistic Spectrum Disorder; ASDI: The Asperger Syndrome (and high-functioning autism) Diagnostic Interview; AQ: Adult Autism Spectrum Quotient; ASSQ: Autism Spectrum Screening Questionnaire; A-TAC: Autism-Tics, ADHD and other Comorbidities Inventory; BPD: Borderline Personality Disorder; DAPP-BQ: Dimensional Assessment of Personality Pathology-Basic Questionnaire; DSM-IV: Diagnostic and statistical manual of mental disorders 4th Edition; DSM-V: Diagnostic and statistical manual of mental disorders 5th Edition; EQ: Empathy Quotient; EROS: Emotion Regulation of Others and Self; FTF: Five to Fifteen; GAF: Global Assessment of Functioning; IEMS: Interpersonal Emotion Management Scale; IPDE: International Personality Disorder Examination; IQ: Intelligence Quotient; MOODS-SR: Mood Spectrum Self-Report; NEO-PI-R: NEO Personality Inventory-Revised; NPD: Narcissistic Personality Disorder; PDD-NOS: Pervasive Developmental Disorder – Not Otherwise Specified; SASB: Structural Analysis of Social Behaviour; SCAN: Schedules for Clinical Assessment in Neuropsychiatry; SCID-5-CV: The Structured Clinical Interview for DSM-5 Clinician Version; SCID-II: The Structured Clinical Interview for DSM-IV Axis II Personality Disorders; SQ-R: Systemising Quotient-Revised; SUAS: Suicide Assessment Scale; TD: Typically Developing; WAIS-III: Wechsler Adult Intelligence Scale 3rd Edition; WAIS-R: Wechsler Adult Intelligence Scale-Revised; ZAN-BPD: Zanarini Rating Scale for Borderline Personality Disorder.

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The Conscious Social Strategies Questionnaire (CSSQ) – exploring a new self-report

measure of 'camouflaging'

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Abstract

Individuals with Autism Spectrum Disorder may use camouflaging behaviour to mask and

compensate for social deficits. This could affect timely diagnosis and have consequences for

wellbeing for these individuals. Previous research has highlighted the need for a measure of

camouflaging behaviour. Thus, the Conscious Social Strategies Questionnaire (CSSQ) was

developed. Four factors emerged from the CSSQ, which appeared to reflect masking strategies,

avoidance strategies, an absence of strategies and compensatory strategies. The CSSQ shows

strong internal consistency and good construct validity. The measure has the potential to be

useful in further investigating levels of camouflaging behaviour in clinical and non-clinical

populations. Further research is necessary to assess discriminant and predictive validity.

Keywords: autism spectrum disorder; social skills; strategies; camouflaging

The Conscious Social Strategies Questionnaire (CSSQ) – exploring a new self-report measure of 'camouflaging'

The American Psychiatric Association characterises Autism Spectrum Disorder (ASD) as a neurodevelopmental disorder distinguished by impairments in social communication and interaction, restrictive and repetitive patterns of behaviour, interests or activities, alongside sensory processing differences (APA 2013). Features of ASD can be found amongst the general population, with measures specifying cut-off points alongside functional impairments, to identify individuals for diagnosis, in line with the *Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM-5*; APA 2013).

One such feature which has recently become a focus of interest in ASD literature is camouflaging behaviour, which originated from research with women with ASD. Camouflaging refers to using particular social strategies to hide autistic behaviours, to prevent others noticing social deficits and generally finding ways to appear more socially skilled. Anecdotal evidence from women with ASD e.g. on online forums, blogs, news stories, illustrate numerous examples of compensatory social strategies being used, with women stating they are more able to blend in and follow social actions by imitating others and following explicit rules they have created for themselves e.g. 'consciously adding inflection and emotion to my voice, being expressive with my face and hands, looking at people when I'm talking to them' (What Exactly Is Masking Autism? 2016).

The use of these conscious social strategies by women with ASD, has been proposed as a potential explanation for the current gender disparity in ASD diagnosis rates between men and women – generally 4:1 (Fombonne 2009). It has been found that this ratio decreases to 2:1 when looking at groups who experience ASD and moderate to severe learning difficulties (e.g.

Wing 1981). This indicates that women with ASD may be being under diagnosed or misdiagnosed. Evidence has been found supporting this hypothesis, showing that girls are less likely to meet the diagnostic criteria for ASD than boys, despite displaying equivalently high levels of ASD-like traits (Dworzynski et al. 2012; Russell et al. 2011). Women who do receive a diagnosis also tend to be older, display greater intellectual disability and have more additional needs (Duvekot et al. 2016; Shattuck et al. 2009).

Numerous studies have discussed that women with ASD may be more motivated to fit in socially than men, and therefore seek to compensate for social deficits, thus appearing outwardly competent and being misdiagnosed by professionals (Attwood 2007; Bargiela et al 2016; Dean et al 2017; Gould and Ashton-Smith 2011; Hull et al. 2017; Kopp and Gillberg 1992; Lai et al. 2011). Lai et al (2015) also discuss that girls' restricted or special interests tend to be more in line with societal expectations e.g. animals, music, celebrities and thus get missed as signs of ASD despite being of an intensity strong enough to warrant a diagnosis. In addition, they note that girls with ASD generally show a greater awareness of the need for social interaction but tend not to initiate this, with few close friendships. This could be construed as being shy or introverted rather than having ASD.

Qualitative studies conducted in female ASD populations highlight a wide variety of conscious social strategies used to mask and compensate for social skills limitations and ASD-related difficulties (Bargiela et al. 2016; Cook et al 2017; Hooper 2016; Tierney et al. 2016). More recently, Hull et al. (2017) conducted a study with individuals with ASD of all genders, and noted that males and individuals identifying as other genders, also reported using social strategies. All these studies identified that the use of social strategies was generally effective, with the aim of fitting in with others and attempting to feel more socially connected. However,

these studies also discussed this camouflaging as having both short and long term adverse consequences, with it being extremely effortful, often resulting in anxiety and exhaustion, requiring extensive practice and preparation, and/or associated recuperation. As such, there is a need for professionals involved in making diagnostic decisions to be informed about the experience of camouflaging and its consequences.

Given the reported negative outcomes resulting from camouflaging for individuals with ASD, it is necessary to examine whether other groups are similarly affected by using conscious social strategies. Hooper (2016) reflected that given societal pressures on women to be empathic and sociable, neurotypical women may also consciously use some of the same social strategies as those used by women with ASD. Hull et al. (2017) also noted that camouflaging is likely to exist on a spectrum akin to other autistic traits, with members of the general population potentially using social coping strategies to appear more socially competent. If true, then we might presume that the use of conscious social strategies may be more widespread and not just specific to particular groups.

It is currently unknown whether individuals other than those with ASD use conscious social strategies and whether the motivations for the use of them are the same as for those with ASD. For example, safety behaviours used by people with social anxiety disorder (Piccirillo et al. 2016), could appear similar to camouflaging behaviours e.g. rehearsing conversation topics prior to social occasions, avoiding social situations altogether, with similar potential negative outcomes e.g. fatigue, increased anxiety. Given the high comorbidity of social anxiety disorder and ASD (Bejerot et al. 2014; Maddox and White 2015), it is possible that the use of conscious social strategies could be a manifestation of social anxiety, warranting further investigation.

Observation and measurement of camouflaging could therefore allow for the facilitation of accurate and timely diagnosis and intervention for vulnerable individuals. One study operationalised camouflaging as the quantitative discrepancy between individuals' external behavioural presentations in social contexts, and their internal status - objectively measured social cognitive capabilities and self-reported autistic traits (Lai et al. 2017). However, to date, there are no formal tools for professionals to use when examining camouflaging behaviour, with research focusing on developing a strong conceptual basis from which to develop measures. Hull et al. (2017) posited that there may be multiple types of camouflaging behaviour used by people with ASD. They discussed themes of masking strategies – using different personas or characters to hide autistic traits; and compensation strategies – monitoring one's behaviours and changing them to appear more in keeping with others.

There is therefore a need for a detailed measure of camouflaging that examines a broad range of relevant social strategies. The aim of the current study was to develop and explore a scale to measure levels of camouflaging behaviour. It is important to note that the aim was primarily to allow for a better understanding of how camouflaging behaviour presents, rather than formally validating the measure. The current study therefore describes the development of the Conscious Social Strategies Questionnaire (CSSQ) and reports on its preliminary psychometric properties. The potential utility of the scale in the diagnostic process for adults showing indicators of autism is explored as are gender effects.

Method

Participants

Participants were 247 adults of 29 different nationalities (75% British). The mean age of the sample was 21.69 years (SD = 6.53, range = 18 - 62). They were eligible to take part in the study if they were over the age of 18. Participants were asked to identify their gender as 'female', 'male' or 'other', and give more details if they wished, with 184 females, 49 males and 14 participants giving other gender identities (non-binary, trans, agender, questioning). Demographic information about the participants, including details of ASD, social anxiety, and depression diagnoses; was obtained, but not included in the current analysis. Participants were recruited via the Bangor University's online student recruitment system, through flyers placed around the university and through advertisements placed on social media.

Materials

The initial item pool for the CSSQ consisted of 28 statements drawn from themes in previous qualitative research (Bargiela et al. 2016; Hooper 2016; Hull et al. 2017) and clinician experience (see Appendix A). A larger number of items than were anticipated to be needed for the final scale were generated, in order to allow for the elimination of those that performed poorly. Response options were 'never', 'sometimes', 'often', and 'always', with 18 positively worded items scored as 0, 1, 2 and 3 respectively. 10 negatively worded items and items of opposite valence were included to avoid response bias, and reverse-scored. Higher scores therefore indicate higher levels of camouflaging. Additionally, an open-ended item was included to ask if participants used any other conscious social strategies, however the information collected from this item was not included in the present analysis.

To assess convergent validity, two further measures were administered. The first was the Short Adult Autism Spectrum Quotient or AQ-10 (Allison et al. 2012). This is a 10 item self-report questionnaire for use with adults to assess for the presence of traits associated with ASD. It looks at five different areas: social skill, attention switching, attention to detail, communication, and imagination. Respondents score their agreement on each item on a 4 point scale from 'definitely agree' to 'definitely disagree'. Each of the items scores 1 point if the respondent endorses abnormal or autistic-like behaviour either mildly or strongly. A score of more than 6 out of 10 is considered significant. Psychometric analysis has shown the AQ-10 to have excellent validity, reliability and strong internal consistency (Allison et al).

Secondly, the Social Interaction Anxiety Scale (Mattick and Clarke 1998) was used. This is a 20 item measure examining levels of anxiety when interacting with other people. Respondents rate their experiences in social situations on a 5 point scale from 'not at all true of me' to 'extremely true of me' with scores ranging from 0 to 4. Three items are counterbalanced to avoid response bias. A score of 43 or above indicates social anxiety – generalised irrational fears across numerous social situations, and scores of 34-43 are indicative of social phobia – specific situations of irrational social fears. The measure has demonstrated good validity and reliability (Mattick and Clarke).

Procedure

If participants saw a link to the online study on a flyer, on social media or on the Bangor University student recruitment system, they could then follow the link to the research study (hosted by Bristol Online Surveys – BOS). An informed consent page was presented after participants had the opportunity to read the information page, outlining how the data provided would be used. Responding with 'no' to any items on the consent page resulted in exclusion

from the study. Those who responded yes to all items then completed all questionnaires. If participants indicated their age was below 18 on the demographic questionnaire, they were directed to the end of the study. Responses were saved securely on the BOS server and no identifying information was asked for. Ethical approval for the research study was obtained from the Bangor University Ethics Committee – 2017-16077.

Statistical Analysis

An exploratory factor analysis with Promax rotation was conducted on the items of the CSSQ, and the extent to which the factors were interpretable and meaningful was examined. Construct validity was assessed by examining Spearman's Rank correlations of scores on the final version of the CSSQ with those on the AQ-10 and the Social Interaction Anxiety Scale, and conducting Mann-Whitney U tests. One-way ANOVAs and post-hoc Games-Howell tests were used compare mean scores on the dependent variables (CSSQ, AQ-10, SIAS) between the three gender groups and to follow up significant main effects, whilst controlling for multiple pairwise comparisons. As variables did not follow normal distributions and could not be normalised by square root or logarithmic transformations, these results were checked with the appropriate non-parametric tests (Kruskal-Wallis and Mann Whitney U tests). Cohen's *d* was calculated as a measure of effect size for post-hoc comparisons.

Results

Item Selection and Factor Structure

Initially, item communalities were inspected and those below 0.3 were removed (Tabachnick and Fidell 2007) – 17 and 21, leaving those which shared substantial common variance. Participant feedback indicated that items with negative wording were confusing and as such, these were also removed (18, 20, 23, 27 and 28). This did not affect counterbalancing for response bias, as several additional items were retained that were of opposite valence, but not negatively worded. The factorability of the remaining 21 CSSQ items was examined - the Kaiser-Meyer-Olkin measure of sampling adequacy was .93, well above the recommended value of .6, and Bartlett's test of Sphericity was significant (χ^2 (210) = 2536.32, p < .001).

The number of factors to extract from the data was determined through parallel analysis (Horn 1965). Here, the number of factors selected is equal to the number of eigenvalues obtained that have values greater than those produced by random, uncorrelated data based on the same number of observations and variables as the original dataset. Based upon this method, four factors were retained for interpretation. An oblique rotation was used (Promax), as it was expected that these factors would be correlated components of a single underlying construct – the use of conscious social strategies or 'camouflaging', and therefore should be correlated to a degree.

The pattern matrix was inspected and any item that had a loading below .4 on all four factors was eliminated (Hair et al. 1998) -2, 4 and 9. The interpretability of the factor structure was examined by the research team, with three further items removed for parsimony (8, 11 and 24), due to item redundancy. The same extraction and rotation procedures were then re-run on the

remaining 15 items. The four identified factors can be seen in Table 1, accounting for a total of 54.63% of the common variance, with a Cronbach's alpha of .90 for the whole scale.

Each factor appeared to consist of a relatively coherent group of strategies. The first factor reflected what may be termed masking strategies, with items representing ways in which participants prepared for social situations by hiding ASD characteristics with different personas or practices. The second factor consisted of items relating to avoidance based strategies to limit social interactions. Items on the third factor reflected an absence of strategies, and items on the fourth factor appeared to reflect in the moment strategies used to monitor and compensate for perceived social skills deficits. The four factors were named masking, avoidance, absence of strategies and compensation respectively. The final proposed CSSQ can be seen in Appendix B.

Table 1: Factor loadings, communalities, eigenvalues and Cronbach's alpha coefficients for the CSSQ (*N*= 247).

_		Fac			
CSSQ Item	1	2	3	4	Communalities
I do research in order to understand how to behave socially	.938				.669
I rely on social media (e.g. YouTube, online forums) to learn what to say or do in social situations	.691				.637
I use films and TV to help me learn what to say or do socially	.553				.574
I pretend to be someone else e.g. a fictional character or someone I know who is confident, to help me in social situations	.629				.334
I practice at home to prepare for social situations e.g. facial expressions, conversation topics	.475				.494
I try to find a quiet place to deter people from talking to me		.913			.734
avoid groups when I can		.561			.543
I put up barriers to stop people talking to me (e.g. keep head down, wear		.732			.628
headphones, read a book, avoid eye contact)					
I behave naturally around other people			.633		.538
I express my thoughts openly and honestly with others			.496		.319
I try to behave as 'true to myself' when with others			.956		.810
I observe and copy the communication of others to help me fit in socially				.766	.676
I have developed 'rules' to help me manage conversations better e.g. 'notice when				.431	.516
I'm talking too much'					
When in public, I try not to engage in movements or make sounds that others would				.429	.335
consider strange					
laugh and pretend to understand jokes even when I don't				.726	.386
Eigenvalues	5.995	1.043	.667	.489	
Cronbach's alpha coefficients (α)	.84	.83	.76	.74	

Extraction method: principal axis factoring. Rotation method: Promax.

Factor correlations can be seen in Table 2 below.

Table 2: Factor Correlations.

Factor	1	2	3
2	.559	-	-
3	.517	.590	-
4	.719	.611	.593

Construct Validity

Total scores were computed for the variables loading on each of the four factors, with higher scores indicating more frequent use of conscious social strategies. Given the high intercorrelations between factors, a total CSSQ score was computed, giving a score range of 0 – 45 (skewness = 0.67, standard error = 0.16, kurtosis = -0.10, standard error = 0.31) Due to non-normal distributions, Spearman's rank correlations were used to examine the relationships between variables. Correlations between total scores on the four CSSQ factors, total CSSQ score and total scores of the AQ-10 and SIAS can be seen in Table 3. All scores displayed significant moderate to strong correlations with each other.

Table 3: Correlations between hand-scored CSSQ factors, AQ-10 scores and SIAS scores.

	Factor 1	Factor 2	Factor 3	Factor 4	CSSQ Total	AQ-10 Total
Factor 2	.551*	-	-	-	-	-
Factor 3	.468*	.530*	-	-	-	-
Factor 4	.694*	.554*	.517*	-	-	-
CSSQ Total	.842*	.795*	.716*	.871*	-	-
AQ-10 Total	.464*	.472*	.417*	.413*	.530*	-
SIAS Total	.525*	.705*	.707*	.653*	.779*	.478*

^{*}All correlations are significant p < .01.

Mann-Whitney U tests showed that participants scoring above cut-off on the AQ-10 and the SIAS, scored significantly more highly on the CSSQ than those who scored below -U = 8397 (p < .001) and U = 13051 (p < .001) respectively. Descriptive statistics for these analyses can be seen below in Table 4.

Table 4: Mean CSSQ scores and standard deviations for participants above and below cut-off on the AQ-10 and SIAS.

		Mean (SD)
AQ-10 -	Above Cut-off ($N = 52$)	24.23 (8.66)
	Below Cut-off (<i>N</i> = 195)	13.44 (6.77)
SIAS -	Above Cut-off $(N = 97)$	22.63 (7.22)
	Below Cut-off ($N = 150$)	11.24 (5.71)

Gender Effects

Kolmogorov-Smirnov and Shapiro-Wilk tests showed that total scores for the CSSQ, AQ-10 and SIAS were not normally distributed. Square root and logarithmic transformations did not normalise distributions and as such non-parametric tests were used to check ANOVAs and Games-Howell corrected post-hoc comparisons. Descriptive statistics can be seen below in Tables 5 and 6.

Table 5: Means and standard deviations for gender groups across total scores on the CSSQ, AQ-10 and SIAS.

	CSSQ	AQ-10	SIAS
	Mean (SD)	Mean (SD)	Mean (SD)
Male (<i>N</i> = 49)	13.43 (6.51)	3.27 (2.04)	26.78 (14.66)
Female (<i>N</i> = 184)	15.36 (8.21)	3.36 (2.20)	37.22 (17.79)
Other $(N = 14)$	28.36 (6.83)	8.21 (1.19)	58.79 (12.35)

CSSQ Total Scores

A one-way ANOVA revealed significant between group differences F(2, 244) = 20.49; p < 0.001, with males and females not being significantly different from each other (p = .196) but the group identifying as other scored significantly higher than males and females (p < .001 in both cases). Cohen's d values were as follows: males vs females = .26, males vs other = 2.24, and females vs other = 1.72. Findings were checked with the Kruskal-Wallis test, which was highly significant ($\chi^2(2) = 26.20$, p < .001). Mann Whitney U tests confirmed that males and females did not score differently from each other (p = .220), but the group identifying as other, scored significantly higher than both males and females (p < .001 in both cases).

AQ-10 Scores

Significant between group differences were found - F(2, 244) = 34.65; p < .001, with males and females not being significantly different from each other once again (p = .953) but the group identifying as other scored higher than both males and females (p < .001 in both cases). Cohen's d values were calculated: males vs females = .04, males vs other = 2.96, and females vs other = 2.27. Once again, findings were checked and confirmed by a Kruskal-Wallis test: χ^2 (2) = 33.83, p < .001 and Mann Whitney U tests: males vs females - p = .821, other vs males and females - p < .001 in both cases.

SIAS Scores

A final one-way ANOVA showed significant between group differences for SIAS scores - F(2, 244) = 20.28; p < .001, with males, females and the group identifying as other scoring significantly differently from each other. Those identifying as other scored more highly than males and females (p < .001 in both cases), and females in turn scored significantly more highly than males (p < .001). Cohen's d values were as follows: males vs females = .64, males vs other

= 2.36, and females vs other = 1.41. Findings were checked and confirmed again by a Kruskal-Wallis test: $\chi^2(2) = 32.03$, p < .001 and Mann Whitney U tests: p < .001 in all cases.

CSSQ Factor Scores

Table 6: Means and standard deviations for gender groups across factor scores on the CSSQ.

	Factor 1	Factor 2	Factor 3	Factor 4
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Male $(N = 49)$	2.53 (2.52)	3.41 (1.94)	3.29 (1.44)	4.20 (2.30)
Female (<i>N</i> = 184)	2.63 (3.08)	3.86 (2.25)	3.66 (2.03)	5.22 (2.91)
Other $(N = 14)$	6.29 (3.67)	7.21 (1.67)	6.86 (1.35)	8.00 (2.00)

ANOVAs found significant between group differences between groups for all four factors - F(2, 244) = 9,88; p < .001, F(2, 244) = 17.66; p < .001, F(2, 244) = 20.53; p < .001, and F(2, 244) = 10.41; p < .001 respectively. Males and females did not score significantly differently from each other on the first three factors (p = .973; p = .347; p = .314 respectively). Females scored significantly higher than males on factor four, p = .03. Those identifying as other scored significantly more highly than males and females on all factors. On factor one, those of other genders scored higher than males, p = .006, and females, p = .007, with p < .001 in all other cases.

Kruskal-Wallis tests confirmed findings for the four factors. Respectively, results were as follows: $\chi^2(2) = 16.27$, p < .001, $\chi^2(2) = 24.58$, p < .001, $\chi^2(2) = 27.72$ p < .001, and $\chi^2(2) = 19.80$, p < .001, and Mann Whitney U tests: p = 0.25 for males vs females on factor 4, p < .001 in all other cases. Cohen's d values can be seen in Table 7 below.

Table 7: Cohen's d values showing effect sizes for differences between genders on scores for the four factors.

	Factor 1	Factor 2	Factor 3	Factor 4
Males vs Females	.04	.21	.21	.39
Males vs Other	1.19	2.10	2.56	1.76
Females vs Other	1.08	1.69	1.86	1.11

Discussion

To our knowledge, this study is the first to develop a self-report measure of camouflaging behaviour in adults. Results indicate that the CSSQ has good psychometric properties – strong internal consistency and good convergent validity. The four factors emerging from the CSSQ appear to reflect different, but related, camouflaging behaviours, with high correlations between factors suggesting that individuals who use one set of strategies are more likely to use other types of strategies.

The first and fourth factors suggest that there may a distinction between using social strategies in an anticipatory way to prepare for social situations with practiced behaviours (i.e. masking strategies) and those that are done through in the moment monitoring to blend in with others (i.e. compensatory strategies). This is in line with previous qualitative research conducted with an autistic population (Hull et al. 2017), identifying these as separate themes.

It is important to note that items on the third factor – an absence of strategies, were reverse scored, therefore positive correlations with this factor denoted negative relationships between variables. The items on this factor could therefore act as a counterbalance to the other items, identifying socially comfortable individuals, and serving to prevent response bias. However, these findings should be interpreted with caution, as it is possible that some individuals may experience social difficulties, but have made a conscious decision not to camouflage.

Within ASD literature, it has been suggested that certain features of the condition - rigidity of thinking and predilection for honesty, could make camouflaging behaviour feel like a false and inauthentic representation of self (Hull et al. 2017). Some autistic individuals may therefore opt to express themselves openly and honestly rather than put on an act to be accepted (Hooper

2016). As people with autism also report that camouflaging is extremely effortful and tiring (Bargiela et al. 2016; Hull et al. 2017) they may consciously choose not to engage in it. Therefore, it is important to note that some individuals with autistic traits may not camouflage. These individuals may come to the attention of appropriate services more easily as a result and therefore the proposed questionnaire might not be as relevant for these individuals.

Avoidance based strategies emerged as a unique factor. In view of the strength of the correlation with scores on this factor, the AQ-10 and SIAS, individuals with higher levels of social anxiety and traits suggestive of ASD may use more avoidance based strategies than those with lower levels. Given the potential negative consequences of social interaction for socially anxious individuals e.g. fears about being seen as socially incompetent, and autistic individuals e.g. being evaluated negatively (Sasson et al. 2017) one could speculate that avoidance based strategies are used as a first line measure to evade social interaction, with other strategies being secondary measures.

This study indicates that camouflaging behaviour appears to be present to some degree in the general adult population, with CSSQ scores being moderately positively skewed. As expected, higher scores on the CSSQ were significantly positively correlated with AQ-10 and SIAS scores, indicating that people with higher levels of ASD traits and/or traits of social anxiety engage in more camouflaging strategies. Indeed individuals who scored above cut-off on the AQ-10 and SIAS showed significantly higher levels of camouflaging behaviour than those who scored below. In line with prior research, this suggests that the use of conscious social strategies serves to make up for perceived social deficits, and could therefore be a useful way of identifying individuals for further assessment.

Further analyses are warranted to identify the individual contribution that both ASD traits and features of social anxiety make to levels of camouflaging, and whether they show additive effects. This is particularly important when noting the high comorbidity of social anxiety and ASD (Bejerot et al. 2014; Maddox and White 2015). This could be conducted in further studies following confirmatory factor analysis with clinical and non-clinical populations.

Gender differences were observed within CSSQ scores, with people identifying as genders other than male or female reporting much higher levels of camouflaging behaviour than men or women. These individuals also reported significantly higher levels of social anxiety than men and women. Given the small sample size in this group, it is important not to overstate the implications of these findings. However, the elevated scores seen in this group suggest comment would be expedient.

Studies have outlined increased mental health problems in individuals of minority gender groups (Bergero-Miguel et al. 2016; Oswalt and Lederer 2017). The fact that these individuals were reporting higher levels of conscious social strategy use suggests that there could be a heightened desire to fit in, possibly due to these individuals being at greater risk of prejudice and discrimination (Fiani and Han 2018). These individuals also reported significantly higher levels of autistic traits than men or women, which would fit the association with autism and identifying as a gender other than male or female (Glidden et al. 2016).

Women also reported higher levels of compensatory or in the moment monitoring strategies, and higher levels of social anxiety than men, which could reflect the increased societal pressure on women to socialise and be empathic (Hooper 2016; Kopp and Gillberg 1992). This added societal pressure could account for some of the gender disparity in the discourse around

camouflaging. Additionally, women and those of other genders may camouflage more than men due to an increased level of social anxiety (Asher et al. 2017). Whilst our results did show males reporting the use of conscious social strategies, prior research indicates that higher levels of camouflaging are linked to depressive symptoms, in men who meet criteria for ASD (Lai et al. 2017). These findings warrant further examination of the associations between mental health symptomatology and camouflaging, across all genders.

As noted above, there has been much discussion in the literature of why women with ASD have not been diagnosed in a timely manner (Bargiela et al. 2016; Gould and Ashton-Smith 2011; Hooper 2016). Prior research has noted that women with ASD may be able to mask social difficulties in some settings but not others (Attwood 2006), with impairments hidden in occupational settings such as work and school, but more apparent at home, with family members being potentially more aware of social deficits. Recent research supports this claim and cautions against relying unduly on observational measures when assessing this population (Ratto et al. 2018). Therefore, using a short measure such as the CSSQ when screening and assessing for ASD, could be useful in alerting diagnosing clinicians to the possibility that social interaction limitations could be being masked by camouflaging.

Strengths, Limitations and Future Directions

A strength of the current study was use of an online methodology to collect data, allowing for an international sample of the general population, increasing the generalisability of results. Whilst camouflaging behaviour was found to be present in the general population, the study called for volunteers to participate in 'research into the use of conscious social strategies'. Therefore, individuals who had experience of camouflaging may have been more inclined to take part and share the link to the study with similar individuals. Additionally, whilst the study

was advertised through multiple means, a student heavy sample was likely to have been obtained, due to the fact that flyers were placed around university buildings and a student research recruitment system was used.

Another limitation was noted by two participants in the current study, who reported that an item on the SIAS did not account for participants who do not identify as heterosexual – 'I have difficulty talking to attractive persons of the opposite sex'. This could have affected findings, as participants who are of minority sexualities may therefore have reported slightly lower levels of social anxiety. Given associations between ASD and identifying with a minority sexuality (Pecora et al. 2016) as well as a relatively high comorbidity of ASD and social anxiety (Bejerot et al. 2014; Maddox and White 2015), future research investigating these issues should take this into account.

It is interesting to note that negatively worded items were viewed by participants as confusing, which is in line with prior research stating that negatively worded items negatively impact scale development (Barnette 2000; Dalal and Carter 2015). This research also notes that positively worded items of opposite valence or directionality, can still serve to prevent response bias and not impact upon readability or present as a methodological artefact in factor analyses, supporting the final version of the scale developed here.

Research into camouflaging has to date focused on those without accompanying intellectual impairments, and it is therefore unclear whether individuals from across the entire autism spectrum use social strategies or not. Whilst intellectual ability was not measured in this study, the CSSQ is the first brief self-report measure of camouflaging that can be orally and visually administered, which therefore might provide researchers with a useful tool with which to

investigate camouflaging across a greater number of those on the autism spectrum, i.e. those with lower cognitive abilities. Future research with representative samples from across the autism spectrum could investigate the utility of the CSSQ with these populations.

It is also important to note that the current study focused on adult participants. It could be useful to develop measures to identify conscious social strategies that children may use. Given that research suggests that camouflaging may be successful in social and occupational contexts but not at home (Attwood, 2006), schoolchildren may appear more socially skilled during clinical observations, which are part of current ASD assessments, with family members seeing more difficulties at home. Consequently, future directions may involve developing a child or parent version of the CSSQ. Gaining parental perspectives on the CSSQ through qualitative research could be valuable to this endeavour, given that family members may see deficits that professionals do not.

A final strength of the study is that the items selected for the questionnaire were based upon a well-established theoretical background, rather than relying primarily upon clinician experience. Conscious social strategies noted by individuals with ASD, such as learning from TV or social media and pretending to be a fictional character, have been longstanding (Holliday Willey 1999). Given the results of the current study in showing that the use of conscious social strategies is generalised to some degree in the entire population, the next stage of research will be to repeat the current study in an ASD population, with a typically developing control group, controlling for factors such as social anxiety and depressive symptoms, to assess the discriminant and predictive validity of the CSSQ.

Conclusion

This study is the first of its kind to propose a brief self-report measure of camouflaging. Whilst camouflaging has been discussed as a primarily female concept within ASD literature, this study has shown that neurotypical people, including males and individuals identifying as other genders, also report camouflaging. Continued development and validation will help to further refine the measure and provide a standard and valid assessment of camouflaging. It is particularly important to demonstrate the ability of the CSSQ to contribute significantly to the prediction of clinical outcomes, given the potential negative consequences of camouflaging. It is the hope that this will improve access to support for individuals who camouflage in the future.

Author Contributions: RL conceived of the study, participated in its design and coordination, performed the quantitative analysis, and drafted the manuscript. KC participated in the study design and helped to draft the manuscript. Both authors read and approved the final manuscript.

Compliance with Ethical Standards

This article does not contain any studies with animals performed by any of the authors.

Ethical approval: All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional and national research committees and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed consent: Informed consent was obtained from all individual participants included in this study.

References

- Allison, C., Auyeung, B., & Baron-Cohen, S. (2012). Toward brief "red flags" for autism screening: the short autism spectrum quotient and the short quantitative checklist in 1,000 cases and 3,000 controls. *Journal of the American Academy of Child & Adolescent Psychiatry*, 51(2), 202-212.
- American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (DSM-5®). American Psychiatric Pub.
- Asher, M., Asnaani, A., & Aderka, I. M. (2017). Gender differences in social anxiety disorder:

 A review. *Clinical psychology review*, 56, 1-12.
- Attwood, T. (2006). The pattern of abilities and development of girls with Asperger's syndrome. In T. Attwood, T. Grandin, T. Bolick, C. Faherty, L. Iland, J. McIlwee Myers, et al. (Eds.), Asperger's and girls(pp. 1–7). Arlington, TX: Future Horizons.
- Attwood, T. (2007). *The complete guide to asperger's syndrome*. London, UK: Jessica Kingsley Publishers.
- Bargiela, S., Steward, R., & Mandy, W. (2016). The experiences of late-diagnosed women with autism spectrum conditions: An investigation of the female autism phenotype. *Journal of autism and developmental disorders*, 46(10), 3281-3294.
- Barnette, J. J. (2000). Effects of stem and Likert response option reversals on survey internal consistency: If you feel the need, there is a better alternative to using those negatively worded stems. *Educational and Psychological Measurement*, 60(3), 361-370.
- Bergero-Miguel, T., García-Encinas, M. A., Villena-Jimena, A., Pérez-Costillas, L., Sánchez-Álvarez, N., de Diego-Otero, Y., & Guzman-Parra, J. (2016). Gender dysphoria and social anxiety: An exploratory study in Spain. *The journal of sexual medicine*, *13*(8), 1270-1278.

- Bejerot, S., Eriksson, J. M., & Mörtberg, E. (2014). Social anxiety in adult autism spectrum disorder. *Psychiatry research*, 220(1), 705-707.
- Cook, A., Ogden, J., & Winstone, N. (2017). Friendship motivations, challenges and the role of masking for girls with autism in contrasting school settings. *European Journal of Special Needs Education*, 1-14.
- Dalal, D. K., & Carter, N. T. (2015). Negatively worded items negatively impact survey research. *More statistical and methodological myths and urban legends*, 112-132.
- Dean, M., Harwood, R., & Kasari, C. (2017). The art of camouflage: Gender differences in the social behaviors of girls and boys with autism spectrum disorder. *Autism*, 21(6), 678-689.
- Duvekot, J., van der Ende, J., Verhulst, F. C., Slappendel, G., van Daalen, E., Maras, A., & Greaves-Lord, K. (2017). Factors influencing the probability of a diagnosis of autism spectrum disorder in girls versus boys. *Autism*, 21(6), 646-658.
- Dworzynski, K., Ronald, A., Bolton, P., & Happé, F. (2012). How different are girls and boys above and below the diagnostic threshold for autism spectrum disorders?. *Journal of the American Academy of Child & Adolescent Psychiatry*, 51(8), 788-797.
- Fiani, C. N., & Han, H. J. (2018). Navigating identity: Experiences of binary and non-binary transgender and gender non-conforming (TGNC) adults. *International Journal of Transgenderism*, 1-14.
- Fombonne, E. (2009). Epidemiology of pervasive developmental disorders. *Pediatric* research, 65(6), 591.
- Glidden, D., Bouman, W. P., Jones, B. A., & Arcelus, J. (2016). Gender dysphoria and autism spectrum disorder: A systematic review of the literature. *Sexual Medicine Reviews*, 4(1), 3-14.

- Gould, J., & Ashton-Smith, J. (2011). Missed diagnosis or misdiagnosis? Girls and women on the autism spectrum. *Good Autism Practice (GAP)*, *12*(1), 34-41.
- Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (1998). *Multivariate data analysis* (Vol. 5, No. 3, pp. 207-219). Upper Saddle River, NJ: Prentice hall.
- Holliday Willey, L. (1999). Pretending to be normal: Living with Asperger's syndrome. *London: Jessica Kingsley*.
- Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika*, 30(2), 179-185.
- Hull, L., Petrides, K. V., Allison, C., Smith, P., Baron-Cohen, S., Lai, M. C., & Mandy, W. (2017). "Putting on my best normal": social camouflaging in adults with autism spectrum conditions. *Journal of autism and developmental disorders*, 47(8), 2519-2534.
- Kopp, S., & Gillberg, C. (1992). Girls with social deficits and learning problems: Autism, atypical Asperger syndrome or a variant of these conditions. *European Child & Adolescent Psychiatry*, 1(2), 89-99.
- Lai, M. C., Lombardo, M. V., Auyeung, B., Chakrabarti, B., & Baron-Cohen, S. (2015).

 Sex/gender differences and autism: setting the scene for future research. *Journal of the American Academy of Child & Adolescent Psychiatry*, 54(1), 11-24.
- Lai, M. C., Lombardo, M. V., Pasco, G., Ruigrok, A. N., Wheelwright, S. J., Sadek, S. A., ... & MRC AIMS Consortium. (2011). A behavioral comparison of male and female adults with high functioning autism spectrum conditions. *PloS one*, 6(6), e20835.
- Lai, M. C., Lombardo, M. V., Ruigrok, A. N., Chakrabarti, B., Auyeung, B., Szatmari, P., ... & MRC AIMS Consortium. (2017). Quantifying and exploring camouflaging in men and women with autism. *Autism*, 21(6), 690-702.

- Maddox, B. B., & White, S. W. (2015). Comorbid social anxiety disorder in adults with autism spectrum disorder. *Journal of autism and developmental disorders*, 45(12), 3949-3960.
- Mattick, R. P., & Clarke, J. C. (1998). Development and validation of measures of social phobia scrutiny fear and social interaction anxiety1. *Behaviour research and therapy*, *36*(4), 455-470.
- Oswalt, S. B., & Lederer, A. M. (2017). Beyond depression and suicide: the mental health of transgender college students. *Social Sciences*, 6(1), 20.
- Pecora, L. A., Mesibov, G. B., & Stokes, M. A. (2016). Sexuality in high-functioning autism:

 A systematic review and meta-analysis. *Journal of autism and developmental disorders*, 46(11), 3519-3556.
- Piccirillo, M. L., Dryman, M. T., & Heimberg, R. G. (2016). Safety behaviors in adults with social anxiety: Review and future directions. *Behavior therapy*, 47(5), 675-687.
- Ratto, A. B., Kenworthy, L., Yerys, B. E., Bascom, J., Wieckowski, A. T., White, S. W., ... & Scarpa, A. (2018). What about the girls? Sex-based differences in autistic traits and adaptive skills. *Journal of autism and developmental disorders*, 48(5), 1698-1711.
- Russell, G., Steer, C., & Golding, J. (2011). Social and demographic factors that influence the diagnosis of autistic spectrum disorders. *Social psychiatry and psychiatric epidemiology*, 46(12), 1283-1293.
- Sasson, N. J., Faso, D. J., Nugent, J., Lovell, S., Kennedy, D. P., & Grossman, R. B. (2017).

 Neurotypical peers are less willing to interact with those with autism based on thin slice judgments. *Scientific reports*, 7, 40700.
- Shattuck, P. T., Durkin, M., Maenner, M., Newschaffer, C., Mandell, D. S., Wiggins, L., ... & Baio, J. (2009). Timing of identification among children with an autism spectrum disorder: findings from a population-based surveillance study. *Journal of the American Academy of Child & Adolescent Psychiatry*, 48(5), 474-483.

- Tabachnick, B. G., & Fidell, L. S. (2007). Using multivariate statistics, 5th. *Needham Height, MA: Allyn & Bacon*.
- Tierney, S., Burns, J., & Kilbey, E. (2016). Looking behind the mask: Social coping strategies of girls on the autistic spectrum. *Research in Autism Spectrum Disorders*, 23, 73-83.
- Wing, L. (1981). Asperger's syndrome: a clinical account. *Psychological medicine*, 11(1), 115-129.

Appendix A: Initial Item List for the CSSQ.

- 1. I behave naturally around other people
- 2. I rely on others to tell me what to say or do socially
- 3. I do research in order to understand how to behave socially
- 4. I deliberately change my voice to fit in better with others
- 5. I try to find a quiet place to deter people from talking to me
- 6. I express my thoughts openly and honestly with others
- 7. I rely on social media (e.g. YouTube, online forums) to learn what to say or do in social situations
- 8. I like to start conversations with new people
- 9. I try to blend in so as to go unnoticed by others
- 10. I use films and TV to help me learn what to say or do socially
- 11. I behave differently around other people
- 12. I observe and copy the communications of others to help me fit in socially
- 13. I have developed 'rules' to help me manage conversations better e.g. 'notice when I'm talking too much'
- 14. I avoid groups of people when I can
- 15. I try to behave as 'true to myself' when with others
- 16. I put up barriers to stop people talking to me (e.g. keep head down, wear headphones, read a book, avoid eye contact)
- 17. I make a conscious effort to make eye contact
- 18. I do not hide who I am when I am interacting with others
- 19. I pretend to be someone else e.g. a fictional character or someone I know who is confident, to help me in social situations
- 20. I do not have to make a conscious effort to fit in
- 21. I observe the body language of others to help me judge what to say or do
- 22. When in public, I try not to engage in movements that others would consider strange
- 23. I do not put on an act in social situations
- 24. New social situations are enjoyable for me
- 25. I practice at home to prepare for social situations e.g. facial expressions, conversation topics
- 26. I laugh and pretend to understand jokes even when I don't
- 27. I do not copy others in social situations
- 28. Being around others is not effortful for me

Appendix B: Proposed Final CSSQ.

The Conscious Social Strategies Questionnaire

Gender: Age:

This is a questionnaire designed to look at social strategies some people use to manage social situations. Some people only use one or two of these and others use many.

Please mark in the boxes below to indicate how often you feel the statement is true for you.

No.		Always	Often	Sometimes	Never
1	I behave naturally around other people				
2	I do research in order to understand how to behave socially				
3	I try to find a quiet place to deter people from talking to me				
4	I express my thoughts openly and honestly with others				
5	I rely on social media (e.g. YouTube, online forums) to learn what to say or do in social situations				
6	I use films and TV to help me learn what to say or do socially				
7	I observe and copy the communication of others to help me fit in socially				
8	I have developed 'rules' to help me manage conversations better e.g. 'notice when I'm talking too much'				
9	I avoid groups of people when I can				
10	I try to behave as 'true to myself' when with others				
11	I put up barriers to stop people talking to me (e.g. keep head down, wear headphones, read a book, avoid eye contact)				
12	I pretend to be someone else e.g. a fictional character or someone I know who is confident, to help me in social situations				
13	When in public, I try not to engage in movements that others would consider strange				
14	I practice at home to prepare for social situations e.g. facial expressions, conversation topics				
15	I laugh and pretend to understand jokes even when I don't				

Do you consciously use any other social strategies that are not listed above? If so, could you please describe what these are?

Author Note

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Contributions to Theory and Clinical Practice

Summary of Outcomes

The findings of both the literature review - focusing on the overlapping symptomology between Autism Spectrum Disorder (ASD) and Borderline Personality Disorder (BPD), and the empirical paper exploring the development of the Conscious Social Strategies Questionnaire (CSSQ), produced several research and clinical implications.

The literature review illustrated that ASD and BPD can share clinical features with regard to difficulties in interpersonal relationships, emotional recognition and regulation, and self-injurious behaviour. This paper noted the importance of considering comorbidity, as individuals with both conditions may represent a more vulnerable group, with an increased risk of suicide. Additionally, findings noted that BPD can potentially be differentiated from ASD through the use of personality inventories, measures of interpersonal functioning and measures of executive functioning.

The empirical paper summarised the history around camouflaging behaviours and emphasised the need for a measure of this phenomenon. This was based upon the longstanding assertions of the autistic community around the concept of using conscious social strategies to fit in, and the impact that this had upon personal and clinical outcomes. A measure of conscious social strategy use was developed using an online sample, demonstrating good internal consistency and construct validity. The paper highlighted how the use of such strategies could be influenced by factors such as gender and levels of social anxiety.

The most significant theme identified across both papers was the issue of having a lack of diagnostic clarity. Individuals who engage in camouflaging, who have ASD traits without accompanying intellectual impairments and who display symptomology of other disorders appear to be significantly misdiagnosed. Increasing awareness and understanding of these issues amongst clinicians appears paramount to supporting these individuals. Findings across both papers also contribute to the theoretical understanding of the interplay between traits of ASD and other psychological phenomena.

Implications for clinical practice

Given the above findings, there are a number of implications for clinical practice. Firstly, in order to raise awareness of the overlap between features of ASD and BPD, the findings of the literature review should be disseminated amongst clinicians working in adult services from primary through to tertiary care settings. This could be accomplished through providing summaries to department heads, to distribute within their teams, or through presentations of the research findings at relevant team meetings. Awareness of the CSSQ and the necessity of replicating the empirical study could also be raised in a similar way. Presentations describing the next stage of research could also be shown at university research fairs, to allow for further validation studies of the questionnaire to be conducted.

Notably, the finding that individuals with comorbid traits of both ASD and BPD may indicate a more vulnerable group — with increased suicidal behaviour, is particularly important to disseminate. This could be valuable when considering formulations of risk and risk management, for both individuals receiving services in the community, and those in inpatient settings. Alerting clinicians to the increased risk of self-injurious or suicidal behaviour in this population may allow for these individuals to access appropriate support in a timely manner,

by identifying those individuals at highest risk. This information may also be important to note with regard to developing the NICE guidance around BPD (CG78, 2009), which currently does not make reference to traits of ASD.

Following on from this, current NICE guidance around assessment of ASD in adults, specify the need to differentiate ASD from other mental health conditions in adults (CG142, 2016), but do not make reference to personality disorders. Additionally, they do not make reference to the use of conscious social strategies or camouflaging behaviour. As a result, healthcare professionals, service users and their families, and carers, are not alert to the possibility of these issues masking ASD. Therefore, individuals with ASD who have comorbid personality disorders or who use compensatory techniques such as camouflaging, may be less likely to be diagnosed as such. It is therefore the author's suggestion that these guidelines be updated to include the consideration of these issues.

This is also important to note when considering NICE guidance around intervention. Missed individuals with ASD may subsequently be given other diagnoses e.g. social anxiety disorder, BPD. There are specific psychological treatments indicated for these conditions - Cognitive Behavioural Therapy and Dialectical Behaviour Therapy. These may not be modified in accordance with suggestions for treating coexisting mental health conditions alongside ASD (CG142, 2016), which recommend making generic adjustments to therapeutic interventions. These interventions may be less effective for misdiagnosed individuals as a result.

Whilst research into specific and targeted interventions for comorbid individuals is in its infancy, the field is growing. Literature has proposed that modified treatments originally indicated for BPD, could have merit for individuals with ASD and comorbid individuals. For

example, Hartmann et al. (2012) propose that modified Dialectical Behaviour Therapy could aid ASD individuals with emotional regulation difficulties. Additionally, a study protocol investigating the efficacy of Schema Therapy for comorbid individuals with ASD and personality disorders has been published (Vuijk, & Arntz, 2017).

However, NICE guidance does not give detailed and specific recommendations on modifying therapies to treat particular coexisting conditions. As noted above, only generic suggestions for psychological interventions as a whole, are made, with clinicians advised to consult non-ASD specific guidelines for the treatment of the comorbid conditions. Consulting separate guidelines around ASD specific interventions and those for comorbid conditions, may result in non-standardised interventions, based primarily on individual clinician judgement. Therefore, specific guidance around modifications to therapies such as DBT and Schema Therapy for adults with ASD, and individual comorbid conditions, could be developed.

Implications for future research and theory development

The research conducted lends support to existing theories surrounding ASD and its overlap with conditions linked to the presence of maltreatment and associated trauma e.g. BPD. Given the findings from the literature review, trauma may be a common factor influencing the manifestation and interplay of ASD and BPD traits. It is interesting to note the parallels with literature concerning children and adolescents here, when examining the findings of the research conducted.

A great deal of research has been conducted examining the interplay between attachment disorders/difficulties and ASD in children, highlighting similar diagnostic dilemmas to those outlined in the literature review. Davidson et al. (2015) notes that reactive attachment disorders

- disorders associated with neglect or abuse, can present with symptomology that appears similar to traits of ASD, leading to diagnostic confusion. For example, Rutter et al. (1999) made reference to children with 'quasi autism' following severely disrupted attachment, and Sadiq et al. (2012) found that in a sample of 35 children with reactive attachment disorder (RAD), 40% also presented with features indicative of ASD according to caregiver report. Indeed, this issue has led to the development of specific assessment tools, designed to differentiate between the two. The Coventry Grid (Moran, 2010, 2015) describes a framework detailing the specific differences between the conditions across a variety of shared phenomena.

Research has also discussed that attachment disorders in childhood are linked to later emerging BPD in adolescence and early adulthood (Mirza et al., 2016). It is clear then, to see the parallels between comparing ASD and attachment difficulties in childhood, and ASD and BPD in adulthood. Given that specific tools exist to allow for differentiation of ASD and attachment related conditions in childhood, similar tools may be of value in adult psychiatric settings. Whilst numerous online blogs have attempted to distinguish between features of both conditions in detail or describe how similarities may occur for particular features (Eartharcher, 2017; Hayman, 2017), to date no formal tools exist to facilitate diagnosis. Qualitative research with adults who have both conditions could therefore be invaluable to the development of such tools, identifying thematic similarities and differences across both conditions.

It is however, important to note that complex case presentations seen in Adult Mental Health settings may not be so easily distinguishable. Adults presenting at services may present with psychopathological features related both to a primary neurodevelopmental deficit, to disordered or disrupted relationships with early caregivers and further traumatic events across the lifespan due to increased vulnerability. Additionally, it is important to note that whilst the

medical model presents ASD and BPD as two real and distinct phenomena, both conditions are in part social constructions, and distinguishing between the two is down to individual clinicians. Diagnostic heuristics lend themselves to particular assumptions, namely that individuals can be affected either with one condition, or another condition, rather than multiple conditions at once. A key finding of both the literature review and the empirical study are that varied mental health symptomology is often present to a comorbid degree in individuals with ASD, and indeed those with traits of ASD. It may be prudent therefore, to take a more holistic, trans-diagnostic and formulation-driven approach when assessing these individuals.

Such an approach could help avoid diagnostic overshadowing and support more targeted and meaningful interventions. It could also allow for a more robust method of understanding the contributions that factors such as trauma, gender, current and prior mental health symptomology as well as neurodevelopmental difficulties make to a clinical picture. This could hopefully provide more confidence in establishing comorbidity and informing clinical decision making. Whilst formal measures are important in establishing diagnoses, the necessity of informed clinical judgement should not be underestimated.

Given the complex interplay between ASD and other factors, it is interesting to note that Dudas et al. (2017) found that heightened systemising abilities are common to both ASD and BPD. The authors suggest that using conscious social strategies to camouflage, may be an expression of an increased systemising capacity, with a desire to analyse and understand social behaviour explicitly. Whilst the current empirical study discusses this in relation to ASD, it could be of merit to explore whether factors linked to the development of BPD symptomology, could also affect the use of conscious social strategies. For example, a history of maltreatment e.g. the

presence of bullying or abuse, was not asked about, which could potentially influence levels of camouflaging behaviour.

The interplay between ASD and other factors is also of relevance when considering further studies using the Conscious Social Strategies Questionnaire (CSSQ). Whilst replications have been discussed above, the authors note that when considering studies conducted in clinical populations, there are several confounding variables that may need be accounted for in order to produce truly robust measures. Regression analyses may be particularly valuable in examining the individual impact of factors such as mental health symptomology and gender upon levels of camouflaging behaviour, and set the scene for work establishing norms and cut-offs. Replication could also aid in further item generation, refinement and selection.

Future research could also improve upon the design of the study discussed above. Whilst information relating to diagnoses of Autism Spectrum Disorder (ASD) was collected in the current study, there was no way to formally confirm these - due to the online nature of data collection, and as such this data was not used in the final analyses. Relatedly, diagnoses of social anxiety disorder and depression were also unconfirmed in the study, and as such were not used. Whilst questions were asked relating to whether diagnoses were formal or informal, the authors did not feel this was sufficiently valid to warrant making group comparisons.

Further research could use a non-online method of data collection to sample individuals with confirmed diagnoses of ASD, and use additional measures such as the Beck Depression Inventory-II (BDI-II, Beck et al., 1998), the Hospital Anxiety and Depression Scale (HADS, Zigmond, & Snaith, 1983), the Generalised Anxiety Disorder-7 (GAD-7, Spitzer et al., 2006)

to formally examine traits of other conditions and therefore lend validity to the results found here.

Reflective commentary

When selecting a topic to conduct my DClinPsy research, it was imperative for me that I felt personally connected to the research. I initially made a hasty decision when it came time to selecting a project, purely to abate my feelings of anxiety around ensuring I was 'on track' with meeting my course requirements. Unsurprisingly, I felt rapidly dissatisfied with the topic I had chosen and made the decision to pursue a different avenue of research. I ensured that I took the time to reflect on what areas of psychology had sparked personal meaning for me and which I was genuinely curious about.

A key motivator for me originally entering the field of psychology, was my own experience of having a sibling diagnosed with ASD, and this diagnosis later being taken away, with various other labels being ascribed to them. The frustrations experienced by my family with regard to this lack of clarity and subsequent sporadic access to meaningful support was an ongoing issue throughout our shared childhood and adolescence. This had also prompted me to read and explore issues around what having traits of ASD meant and indeed how the concept of ASD was defined. I noted that both during my undergraduate degree and my clinical work prior to clinical psychology training, I had been fascinated by ASD and the gender differences I observed. I had been intrigued by the markedly different manner that women and girls with ASD were treated by professionals, family members and carers, compared to men and boys with ASD. From these reflections, it felt fitting that I should conduct my thesis research in this area.

I have been privileged to take part in a personal and professional development scheme, via the use of therapy vouchers given to trainees by the training programme. During my time using the scheme, and discussing my experiences of conducting my research, it was suggested to me that perhaps I had chosen a topic that reflected a heightened capacity for systemising within myself, with a strong drive to analyse and create order. This did not surprise me, as perhaps unusually, another area that has always interested me throughout my career in psychology, is that of psychometrics and statistics. I enjoy seeing how constituent parts of a phenomenon can make up a whole, and how they fit together. Therefore, developing a psychometric measure aligned with this drive very well.

This led me to make a number of reflections during the analysis of my data. The somewhat subjective nature of factor analysis, meant there was no 'right answer', which frustrated me at times and raised my anxiety levels. This was most apparent throughout the process of item and factor selection. I repeatedly analysed my data using different models and numbers of factors, with different items, in an attempt to find the 'right answer', becoming increasingly anxious about choosing the right model and the right items with the right analytical methods. Reflecting on this with my research supervisors allowed me to have the confidence to step back from the process of analysis and return to it with a different approach. Rather than rigidly seeking a right answer, I allowed myself to be guided by the data and refine items based on more subjective criteria, such as factor interpretability. I was also able to recognise and accept that my empirical study is merely the first step in the process of developing a valid and reliable scale, not the finished article.

Throughout the process of conducting my empirical study I considered my epistemological stance, and noted a duality in this. When reading around the topic of camouflaging, I noted that

my stance was that of a naïve realist, with the phenomenon of camouflaging appearing longstanding and concrete. Therefore, developing a psychometric instrument to measure this seemed appropriate. However, when reading current personal blogs and accounts of individuals with ASD who describe camouflaging, it felt to me that camouflaging had become more of a socially constructed phenomenon in recent times, along with ASD more generally. I wondered whether by creating a measure, I was shaping the concept of camouflaging as a phenomenon. I also wondered whether this shift in stance also reflects the change in diagnostic criteria regarding the condition, from separate categorical classifications to the conceptualisation of a spectrum.

Having the opportunity to create an original piece of research, has been a surprisingly emotive process. Perhaps naively, I felt that collecting data through an online methodology would create a level of distance between myself and the participants who took part in my study. However, I found myself experiencing a significant range of emotions as participants emailed me. Most notably, I found myself feeling guilty and reflecting upon my own unconscious biases, following emails from two participants. These alerted me to the fact that an item on the social anxiety scale I had used was heteronormative and I reflected upon the fact that despite having undergone a review by the university ethics committee, this had not been picked up. Nonetheless, both participants also commented on the quality of the study positively with one stating that my research was 'very much needed', which was extremely validating.

References

- Beck, A. T., Steer, R. A., & Brown, G. K. (1996). Beck depression inventory-II. San Antonio, 78(2), 490-8.
- Davidson, C., O'Hare, A., Mactaggart, F., Green, J., Young, D., Gillberg, C., & Minnis, H.
 (2015). Social relationship difficulties in autism and reactive attachment disorder:
 Improving diagnostic validity through structured assessment. Research in developmental disabilities, 40, 63-72.
- Dudas, R. B., Lovejoy, C., Cassidy, S., Allison, C., Smith, P., & Baron-Cohen, S. (2017). The overlap between autistic spectrum conditions and borderline personality disorder. *PloS one*, *12*(9), e0184447.
- Eartharcher, L. (2017, March 5). Asperger's / autism vs Borderline Personality Disorder (BPD)

 [Blog post]. Retrieved from https://thesilentwaveblog.wordpress.com/2017/03/05/aspergers-autism-vs-borderline-personality-disorder-bpd/
- Hartmann, K., Urbano, M., Manser, K., & Okwara, L. (2012). Modified dialectical behavior therapy to improve emotion regulation in autism spectrum disorders. In Richardson, C.,
 Wood, R., (Eds.), *Autism spectrum disorders* (pp. 41-72). Hauppauge, NY: Nova Science Publishers.
- Hayman, K. (2017, December 7). What It's Like to Live With Both Autism Spectrum Disorder and Borderline Personality Disorder [Blog post]. Retrieved from https://themighty.com/2017/12/what-having-both-autism-and-borderline-personality-disorder-is-like-asd-bpd/

- Mirza, K., Mwimba, G., Pritchett, R., & Davidson, C. (2016). Association between reactive attachment disorder/disinhibited social engagement disorder and emerging personality disorder: a feasibility study. *The Scientific World Journal*, 2016.
- Moran, H. (2010). Clinical observations of the differences between children on the autism spectrum and those with attachment problems: The Coventry Grid. *Good Autism Practice (GAP)*, 11(2), 46-59.
- Moran, H. (2015). *The Coventry Grid Version* 2. Available from: https://www2.oxfordshire.gov.uk/cms/sites/default/files/folders/documents/virtualsch ool/processesandforms/resourcesandpublications/CoventryGrid.pdf (accessed 15 May 2018).
- National Institute for Health and Care Excellence. (2016). Autism spectrum disorder in adults: diagnoisis and management. Retrieved from https://www.nice.org.uk/guidance/CG142
- National Institute for Health and Care Excellence. (2009). *Borderline personality disorder:* recognition and management. Retrieved from https://www.nice.org.uk/guidance/cg78
- Rutter, M., Andersen-Wood, L., Beckett, C., Bredenkamp, D., Castle, J., Groothues, C., ... & O'Connor, T. G. (1999). Quasi-autistic patterns following severe early global privation. *The Journal of Child Psychology and Psychiatry and Allied Disciplines*, 40(4), 537-549.
- Sadiq, F. A., Slator, L., Skuse, D., Law, J., Gillberg, C., & Minnis, H. (2012). Social use of language in children with reactive attachment disorder and autism spectrum disorders. *European child & adolescent psychiatry*, 21(5), 267-276.
- Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: the GAD-7. *Archives of internal medicine*, 166(10), 1092-1097.

- Vuijk, R., & Arntz, A. (2017). Schema therapy as treatment for adults with autism spectrum disorder and comorbid personality disorder: Protocol of a multiple-baseline case series study testing cognitive-behavioral and experiential interventions. *Contemporary Clinical Trials Communications*, 5, 80-85.
- Zigmond, A. S., & Snaith, R. P. (1983). The hospital anxiety and depression scale. *Acta psychiatrica scandinavica*, 67(6), 361-370.

Ethics Appendix A: School of Psychology Ethics Application

Application for Ethical Approval

Project Title: The conscious social strategies questionnaire (CSSQ): a self report measure of

camouflaging

Principal investigator: Ladha, Ruhina

Other researchers: Cole, Kristina, Saville, Christopher

Pre-screen Questions

Type of Project

D.Clin.Psy

What is the broad area of research

Clinical/Health

Funding body

Internally Funded

Type of application (check all that apply)

Project requiring scrutiny from an outside body which has its own ethical forms and review procedures

Proposed methodology (check all that apply)

Ouestionnaires and Interviews

Do you plan to include any of the following groups in your study?

Does your project require use of any of the following facilities and, if so, has the protocol been reviewed by the appropriate expert/safety panel? If yes please complete Part 2:B

If your research requires any of the following facilities MRI, TMS/ tCS, Neurology Panel, has the protocol been reviewed by the appropriate expert/safety panel?

Connection to Psychology, (i.e. why Psychology should sponsor the question)

Investigator is a student in Psychology (including the North Wales Clinical Psychology Programme)

Does the research involve NHS patients? (NB: If you are conducting research that requires NHS ethics approval make sure to consult the Psychology Guidelines as you may not need to complete all sections of the Psychology online application)

No

Has this proposal been reviewed by another Bangor University Ethics committee?

No

NHS checklist. Does your study involve any of the following?

Part 1: Ethical Considerations

Will you describe the main experimental procedures to participants in advance, so that they are informed about what to expect?

Yes

Further details: Potential participants will see a detailed information page on the first page of the online survey. The same information will be presented on the flyer.

Will you tell participants that their participation is voluntary?

Yes

Further details: The information page and flyer clearly detail that participation is voluntary.

Will you obtain written consent for participation?

Yes

Further details: An informed consent page will be presented and participants have the option to click yes or no. Clicking yes will take the participants to the questionnaire pages and clicking no will end the survey.

If the research is observational, will you ask participants for their consent to being observed? N/A

Will you tell participants that they may withdraw from the research at any time and for any reason? Yes

Further details: The consent form page details the right to withdraw in full. Participants have the option to click yes or no. Clicking yes will take the participants to the questionnaire pages and clicking no will end the survey. They can also click off the study page at any time.

With questionnaires, will you give participants the option of omitting questions they do not want to answer?

No

Further details: In order to analyse the results of the questionnaires and to ensure results are valid all questions must be completed.

Will you tell participants that their data will be treated with full confidentiality and that, if published, it will not be identifiable as theirs?

Yes

Further details: The information page clearly details that all data will be confidential and that no personal identifying information is to be collected.

Will you debrief participants at the end of their participation (i.e. give them a brief explanation of the study)?

Yes

Further details: Participants will see a debrief page giving an explanation of the study and signposting them to relevant research, health professionals and national organisations should they wish to find out more or request help.

Will your project involve deliberately misleading participants in any way?

No

Is there any realistic risk of any participants experiencing either physical or psychological distress or discomfort? If *Yes*, give details and state what you will tell them to do should they experience any problems (e.g., who they can contact for help)

Yes

Further details: Although, there is no intention of creating psychological distress some distress may occur when individuals are completing questionnaires regarding their social skills and potential ASD traits as this may cause reflection of their own mental health state and personality. The researcher is a trainee clinical psychologist and the research supervisor is a qualified psychologist, both of whom have skills in order to deal with distress and the researcher contact details are provided on the debrief page. Participants will also be signposted to their local health professionals and ASD organisations.

Is there any realistic risk of any participants experiencing discomfort or risk to health, subsequent illness or injury that might require medical or psychological treatment as a result of the procedures? No

Does your project involve work with animals? If *Yes* please complete Part 2: B
No

Does your project involve payment to participants that differs from the normal rates? Is there significant concern that the level of payment you offer for this study will unduly influence participants to agree to procedures they may otherwise find unacceptable? If *Yes* please complete Part 2: B and explain in point 5 of the full protocol

No

If your study involves children under 18 years of age have you made adequate provision for child protection issues in your protocol?

N/A

If your study involves people with learning difficulties have you made adequate provision to manage distress?

N/A

If your study involves participants covered by the Mental Capacity Act (i.e. adults over 16 years of age who lack the mental capacity to make specific decisions for themselves) do you have appropriate consent procedures in place? NB Some research involving participants who lack capacity will require review by an NHS REC. If you are unsure about whether this applies to your study, please contact the Ethics Administrator in the first instance

N/A

If your study involves patients have you made adequate provision to manage distress?

N/A

Does your study involve people in custody?

No

If your study involves participants recruited from one of the Neurology Patient Panels or the Psychiatry Patient Panel then has the protocol been reviewed by the appropriate expert/safety panel? N/A

If your study includes physically vulnerable adults have you ensured that there will be a person trained in CPR and seizure management at hand at all times during testing?

N/A

Is there significant potential risk to investigator(s) of allegations being made against the investigator(s). (e.g., through work with vulnerable populations or context of research)?

No

Is there significant potential risk to the institution in any way? (e.g., controversiality or potential for misuse of research findings.)

No

Part 3: Risk Assessment

Is there significant potential risk to participants of adverse effects?

No

Is there significant potential risk to participants of distress?

Yes

Further details: Participants will be members of the general public, therefore there is a possibility that potential participants may not be already familiar with their right to consent and withdraw from research. The participant information page and consent form will outline choice to participate and how to withdraw from the study at any time. The page will also explain the rationale of the study. Although, there is no intention of creating psychological distress some distress may occur when individuals are completing questionnaires regarding their social skills and potential ASD traits as this may cause reflection of their own mental health state and personality. The researcher is a trainee clinical psychologist and the research supervisor is a qualified psychologist, both of whom have skills in order to deal with distress and the researcher contact details are provided on the debrief page. Participants will also be signposted to their GP/local health professionals and ASD organisations.

Is there significant potential risk to participants for persisting or subsequent illness or injury that might require medical or psychological treatment?

No

Is there significant potential risk to investigator(s) of violence or other harm to the investigator(s) (e.g., through work with particular populations or through context of research)?

No

Is there significant potential risk to other members of staff or students at the institution? (e.g., reception or other staff required to deal with violent or vulnerable populations.)

No

Does the research involve the investigator(s) working under any of the following conditions: alone; away from the School; after-hours; or on weekends?

No

Does the experimental procedure involve touching participants?

No

Does the research involve disabled participants or children visiting the School?

No

Declaration

Declaration of ethical compliance: This research project will be carried out in accordance with the guidelines laid down by the British Psychological Society and the procedures determined by the School of Psychology at Bangor. I understand that I am responsible for the ethical conduct of the research. I confirm that I am aware of the requirements of the Data Protection Act and the University's Data Protection Policy, and that this research will comply with them.

Declaration of risk assessment. The potential risks to the investigator(s) for this research project have been fully reviewed and discussed. As an investigator, I understand that I am responsible for managing my safety and that of participants throughout this research. I will immediately report any adverse events that occur as a consequence of this research.

Yes

Yes

Declaration of conflict of interest: To my knowledge, there is no conflict of interest on my part in carrying out this research.

Yes

Part 2: A

The potential value of addressing this issue

Hypotheses

Participants recruitment. Please attach consent and debrief forms with supporting documents

Research methodology

Estimated start date and duration of the study.

For studies recruiting via SONA or advertising for participants in any way please provide a summary of how participants will be informed about the study in the advertisement. N.B. This should be a brief factual description of the study and what participants will be required to do.

Part 2: B

Brief background to the study

Further details: Recent qualitative studies (e.g. Bargiela, Steward Mandy, 2016) suggest that women with ASD use a variety of strategies to mask and compensate for social skills limitations, often using external aids as social guides. Preliminary research also identifies a subgroup of women who choose to be 'true to themselves' by not camouflaging - being open and honest. It would appear that women with ASD adopt social roles that are based on intellect, rather than social intuition. Therefore, it is suggested that present diagnostic criteria should take this into account, otherwise diagnoses for women will be missed (Gould and Ashton-Smith, 2011). The current study therefore hopes to build on previous research, by developing a questionnaire to see how extensive the use of conscious social strategies is in the general population and the overlap between these and features of ASD. This would potentially allow for a new tool which better identifies masking strategies in both women and men, and could be conducive to improving diagnostic measures for women with ASD. The AQ-10 (Allison, Auyeung, Baron-Cohen, 2012) and the Social Interaction Anxiety Scale (SIAS; Mattick Clark, 1998) would be used as comparison measures with the proposed measure.

The hypotheses

Further details: The primary aim of the study is to identify any latent variables within the proposed questionnaire through factor analysis. Correlations between all variables measured will then be conducted to investigate the relationships between these. As such, the hypotheses are looking at the following questions: Is there a correlation between features of ASD and the use of conscious social strategies? Is there a gender difference between use of conscious social strategies? Does social anxiety correlate with features of ASD and/or the use of conscious social strategies?

Participants: recruitment methods, age, gender, exclusion/inclusion criteria

Further details: Flyers advertising the link to the study will be placed around the university - this will be a copy of the participant information page. The study will be made available online and linked to on social media platforms e.g. Tumblr, Facebook, Twitter with the same information page preceding it. Upon seeing the link to the study, any member of the public can choose to click on it and participate in the study. Participants will be excluded if they are under the age of 18. Participants will be members of the general public.

Research design

Further details: Questionnaire Design, participants will be asked to complete a series of three measures online, and exploratory factor analysis and Pearson's correlations will be conducted between the variables identified.

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Procedures employed

Further details: Using Bristol Online Survey software, participants will complete the three

questionnaires online. Participants will also be asked to provide demographic information including

age, gender, country, diagnosis of anxiety, depression and/or ASD. A debrief page will give contact

details of the researchers and signpost to relevant other agencies.

Measures employed

Further details: The proposed Conscious Social Strategies Questionnaire The AQ-10 (Allison,

Auyeung, Baron-Cohen, 2012) The Social Interaction Anxiety Scale (SIAS; Mattick Clark, 1998)

Oualifications of the investigators to use the measures (Where working with children or vulnerable

adults, please include information on investigators' CRB disclosures here.)

Further details: The measures are freely available and their use and interpretation will be by the principal

investigator - Ruhina Ladha, a trainee clinical psychologist and Dr Kristina Cole, a Chartered Clinical

Psychologist.

Venue for investigation

Further details: Bangor University

Estimated start date and duration of the study (N.B. If you know that the research is likely to continue

for more than three years, please indicate this here).

Further details: 24/07/2017 to 01/10/2020. From seeing the information page to potentially being sent

a summary page of the findings, to some extent the participants will be involved for a maximum of 12

months. However, participants will only actually be actively involved in the research process

(completing questionnaires) for approximately 30 minutes.

Data analysis

Further details: Exploratory factor analysis will be used to investigate the latent variables within the

proposed CSSQ measure. If data does not violate the assumptions of parametric tests, Pearson's

correlations will be used to examine relationships between these variables and ASD features, social

anxiety, age and gender.

Potential offence/distress to participants

Further details: It is not anticipated that the questionnaires will elicit undue psychological distress,

however, if this occurs, the researcher is a trainee clinical psychologist and research supervisor is an

experienced qualified clinical psychologist who have the skills necessary to manage high levels of

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emotion or distress - contact details will be provided. Signposting to GP/local health professionals is

provided on the debrief page.

Procedures to ensure confidentiality and data protection

Further details: Password protected SPSS (data analysis program) documents, each participant will be

assigned a specified research identification number, to uphold their anonymity and no identifiers are

being collected. All data will be kept and stored on record in accordance with Bangor University

procedures. If data requires transferring between computers it will be stored on an encrypted USB stick

and files will only be accessed at Bangor University computers. Contact details of participants if they

choose to give them, will be kept securely on an encrypted USB stick and destroyed after those

requesting feedback have been sent it.

*How consent is to be obtained (see BPS Guidelines and ensure consent forms are expressed

bilingually where appropriate. The University has its own Welsh translations facilities on extension

2036)

Further details: Information sheets and consent forms will be displayed online detailing the rights of

participants and the study details. These will be translated into Welsh.

Information for participants (provide actual consent forms and information sheets) including if

appropriate, the summary of the study that will appear on SONA to inform participants about the

study. N.B. This should be a brief factual description of the study and what participants will be

required to do.

Further details: See attached documentation - information page, flyer consent form.

Approval of relevant professionals (e.g., GPs, Consultants, Teachers, parents etc.)

Further details: The proposal for this study has been reviewed and approved following amendments

requested by the North Wales Clinical Psychology Programme at Bangor University. The research team

are a group independent from the researcher who analyse the viability of the research proposal.

Payment to: participants, investigators, departments/institutions

Further details: N/A

Equipment required and its availability

Further details: Bristol Online Survey software, and the Bangor University SONA System, the

availability of which have been confirmed.

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If students will be engaged a project involving children, vulnerable adults, one of the neurology

patient panels or the psychiatric patient panel, specify on a separate sheet the arrangements for

training and supervision of students. (See guidance notes)

Further details: N/A

If students will be engaged in a project involving use of MRI or TMS, specify on a separate sheet the

arrangements for training and supervision of students. (See guidance notes)

Further details: N/A

What arrangements are you making to give feedback to participants? The responsibility is yours to

provide it, not participants' to request it.

Further details: A debrief page is provided at the end of the survey, and the contact details of the

researchers are provided, should participants get in contact, a one page summary of the study findings

will be provided to them.

Finally, check your proposal conforms to BPS Guidelines on Ethical Standards in research and sign

the declaration. If you have any doubts about this, please outline them.

Part 4: Research Insurance

Is the research to be conducted in the UK?

Yes

Is the research based solely upon the following methodologies? Psychological activity, Questionnaires, Measurements of physiological processes, Venepuncture, Collections of body secretions by non-invasive methods, The administration by mouth of foods or nutrients or variation of diet other than the administration of drugs or other food supplements

Yes

Research that is based solely upon certain typical methods or paradigms is less problematic from an insurance and risk perspective. Is your research based solely upon one or more of these methodologies? Standard behavioural methods such as questionnaires or interviews, computer-based reaction time measures, standardised tests, eye-tracking, picture-pointing, etc; Measurements of physiological processes such as EEG, MEG, MRI, EMG, heart-rate, GSR (not TMS or tCS as they involve more than simple 'measurement'); Collections of body secretions by non-invasive methods, venepuncture (taking of a blood sample), or asking participants to consume foods and/or nutrients (not including the use of drugs or other food supplements or caffine).

Yes

Ethics Appendix B: School of Psychology Ethical Approval.

From: ethics@bangor.ac.uk Sent: Mon 25/09/2017, 14:32 To: Ruhina Fatema Ladha

Dear Ruhina,

2017-16077 The conscious social strategies questionnaire (CSSQ): a self report measure of camouflaging

Your research proposal number 2017-16077 has been reviewed by the Psychology Ethics and Research Committee and the committee are now able to confirm ethical and governance approval for the above research on the basis described in the application form, protocol and supporting documentation. This approval lasts for a maximum of three years from this date.

Ethical approval is granted for the study as it was explicitly described in the application

If you wish to make any non-trivial modifications to the research project, please submit an amendment form to the committee, and copies of any of the original documents reviewed which have been altered as a result of the amendment. Please also inform the committee immediately if participants experience any unanticipated harm as a result of taking part in your research, or if any adverse reactions are reported in subsequent literature using the same technique elsewhere.

Ethics Appendix C: School of Psychology Ethical Approval of Amendment.

From: ethics@bangor.ac.uk Sent: Sun 17/12/2017, 22:33 To: Ruhina Fatema Ladha

Dear Ruhina,

2017-16077-A14181 Amendment to The conscious social strategies questionnaire (CSSQ): a self report measure of camouflaging

Your research proposal number 2017-16077-A14181 has been reviewed by the Psychology Ethics and Research Committee and the committee are now able to confirm ethical and governance approval for the above research on the basis described in the application form, protocol and supporting documentation. This approval lasts for a maximum of three years from this date.

Ethical approval is granted for the study as it was explicitly described in the application

If you wish to make any non-trivial modifications to the research project, please submit an amendment form to the committee, and copies of any of the original documents reviewed which have been altered as a result of the amendment. Please also inform the committee immediately if participants experience any unanticipated harm as a result of taking part in your research, or if any adverse reactions are reported in subsequent literature using the same technique elsewhere.

Ethics Appendix D: English and Welsh Flyers.



Volunteers needed for research into the use of conscious social strategies



Ruhina Ladha and Dr Kristina Cole

What is the purpose of this project?

The purpose of this project is to develop a questionnaire to identify the nature and prevalence of the conscious social strategies (or social 'camouflaging' behaviours) people use. We are looking at how the use of these strategies corresponds to levels of social anxiety and/or traits of Autism Spectrum Disorder (ASD). Measuring the use of these strategies will add to the limited body of literature in this area of psychology, and the results could contribute towards further development of questionnaires on this subject.

Who is doing this research and why?

The project is part of Ruhina Ladha's (Trainee Clinical Psychologist with the North Wales Clinical Psychology Programme) doctoral research project, supported by Bangor University and supervised by Dr Kristina Cole (Clinical Psychologist). Both investigators are members of the British Psychological Society. It has been reviewed and approved by the Bangor University Ethics Committee.

What will I be asked to do?

You will be required to complete a series of three short questionnaires about your behaviour in social situations and around traits of ASD and social anxiety. These are not intended to be diagnostic.

How long will it take?

The questionnaires should take no longer than 15 – 25 minutes to complete

Will my taking part in this study be kept confidential?

Yes, the confidentiality of participants will be assured. No identifying information is asked for and all data will be stored securely.

How do I find out more/take part?

If you are interested in being part of this research project and would like more details please contact Ruhina Ladha, Trainee Clinical Psychologist, Bangor University, at psp6b1@bangor.ac.uk

If you choose to get in contact, your details will be kept confidential, stored securely and destroyed after the study has ended.

Links to the study directly can be found below.

Thank you for your help with my project,

Ruhina Ladha

| https://bangor.onlinesurveys.ac. |
|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|
| uk/the-conscious-social- |
| strategies-questionnaire |



Yn eisiau - gwirfoddolwyr ar gyfer ymchwil i'r defnydd o strategaethau cymdeithasol ymwybodol



Ruhina Ladha a Dr Kristina Cole

Beth yw diben y project hwn?

Pwrpas y project hwn yw datblygu holiadur i nodi natur a mynychder y strategaethau cymdeithasol ymwybodol (neu ymddygiad 'cuddliwio' cymdeithasol) y mae pobl yn eu defnyddio. Rydym yn edrych ar sut mae defnyddio'r strategaethau hyn yn cyfateb â lefelau pryder cymdeithasol ac/neu nodweddion Anhwylder Sbectrwm Awtistaidd. Bydd mesur y defnydd a wneir o'r strategaethau hyn yn ychwanegu at y llenyddiaeth gyfyngedig a geir yn y maes seicoleg hwn, a gallai'r canlyniadau gyfrannu tuag at ddatblygu holiaduron pellach yn edrych ar y pwnc.

Pwy sy'n gwneud yr ymchwil a pham?

Mae'r project yn rhan o broject ymchwil doethurol Ruhina Ladha (Seicolegydd Clinigol dan Hyfforddiant gyda Rhaglen Seicoleg Glinigol Gogledd Cymru) gyda chefnogaeth Prifysgol Bangor o dan oruchwyliaeth Dr Kristina Cole (Seicolegydd Clinigol). Mae'r ddau ymchwilydd yn aelodau o Gymdeithas Seicoleg Prydain. Mae'r astudiaeth wedi'i hadolygu a'i chymeradwyo gan Bwyllgor Moeseg Prifysgol Bangor.

Beth y gofynnir i mi ei wneud?

Gofynnir i chi lenwi tri holiadur byr am eich ymddygiad mewn sefyllfaoedd cymdeithasol ac am nodweddion Anhwylder Sbectrwm Awtistaidd a phryder cymdeithasol. Nid eu bwriad yw bod yn ddiagnostig.

Faint o amser fydd hyn yn ei gymryd?

Ni ddylai'r holiaduron gymryd mwy na 15 - 25 munud i'w llenwi.

A fydd fy nghyfraniad at yr astudiaeth hon yn cael ei gadw'n gyfrinachol?

Bydd, cedwir gwybodaeth am y cyfranogwyr yn hollol gyfrinachol. Ni ofynnir am unrhyw wybodaeth y gellir ei defnyddio i'ch adnabod a bydd yr holl ddata yn cael ei gadw yn ddiogel.

Sut gaf i wybod mwy/gymryd rhan?

Os oes gennych ddiddordeb mewn bod yn rhan o'r project ymchwil hwn, ac os hoffech fwy o fanylion, cysylltwch â Ruhina Ladha, Seicolegydd Clinigol dan Hyfforddiant, Rhaglen Seicoleg Glinigol Gogledd Cymru, Prifysgol Bangor, psp6b1@bangor.ac.uk

Os dewiswch gysylltu, cedwir eich manylion yn gyfrinachol, a chânt eu cadw yn ddiogel a'u dinistrio pan ddaw'r astudiaeth i ben.

Ceir dolenni uniongyrchol at yr astudiaeth isod.

Diolch yn fawr am eich cymorth gyda'r project,

Ruhina Ladha

https://bangor.onlinesurveys .ac.uk/the-conscious-social- strategies-questionnaire https://bangor.onlinesurveys	strategies-questionnaire https://bangor.onlinesurveys .ac.uk/the-conscious-social-	https://bangor.onlinesurveys .ac.uk/the-conscious-social- strategies-questionnaire							
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Ethics Appendix E: English and Welsh Information Pages.

Page 1: Participant Information

The Conscious Social Strategies Questionnaire (CSSQ): a self-report measure of 'camouflaging'.

Ruhina Ladha and Dr Kristina Cole

What is the purpose of this project?

The purpose of this project is to develop a questionnaire to identify the nature and prevalence of the conscious social strategies (or social 'camouflaging' behaviours) people use. We are looking at how the use of these strategies corresponds to levels of social anxiety and/or traits of Autism Spectrum Disorder (ASD). Measuring the use of these strategies will add to the limited body of literature in this area of psychology, and the results could contribute towards further development of questionnaires on this subject.

Who is doing this research and why?

The project is part of Ruhina Ladha's (Trainee Clinical Psychologist) doctoral research project with the North Wales Clinical Psychology Programme (NWCPP) at Bangor University and is supervised by Dr Kristina Cole (Clinical Psychologist). Both investigators are members of the British Psychological Society (BPS). The study has been reviewed and approved by the Bangor University Ethics Committee.

Who can take part?

At this stage, the study is open to adults over the age of 18.

What will I be asked to do?

You will be required to complete a series of three short questionnaires about your behaviour in social situations and around traits of ASD and social anxiety. These are not intended to be diagnostic.

Once I take part, can I change my mind?

Yes. You can withdraw at any time, for any reason and you will not be asked to explain your reasons for withdrawing. Please contact Ruhina if you wish to withdraw your responses. However, once the research has been submitted (May/June 2018), it will not be possible to withdraw your individual data from the research. If you do not complete the survey, all your answers will be deleted.

How long will it take?

The questionnaires should take no longer than 15 – 25 minutes to complete

Will my taking part in this study be kept confidential?

Yes, the confidentiality of participants will be assured. No identifying information is asked for and all data will be stored securely.

I have some more questions; who should I contact?

Please contact the main investigator with any questions you may have: Ruhina Ladha, Trainee Clinical Psychologist, NWCPP, Bangor University, psp6b1@bangor.ac.uk

Dr Kristina Cole, Clinical Psychologist (supervisor), Kristina.Cole@wales.nhs.uk

If you choose to get in contact, your details will be kept confidential, stored securely and destroyed after the study has ended.

Thank you for your help with my project, Ruhina Ladha

Holiadur Strategaethau Cymdeithasol Ymwybodol (HSCY): hunan-adroddiad am fesur 'cuddliwio'. Ruhina Ladha a Dr Kristina Cole

Beth yw pwrpas y prosiect?

Pwrpas y prosiect hwn yw datblygu holiadur i nodi natur a chyffredinolrwydd y strategaethau cymdeithasol ymwybodol (neu ymddygiad 'cuddliwio' cymdeithasol) a ddefnyddir gan bobl. Rydym yn edrych ar sut mae defnyddio'r strategaethau hyn yn cyfateb â lefelau pryder cymdeithasol a/neu nodweddion Anhwylderau Sbectrwm Awtistiaeth (ASD). Bydd mesur deunydd y strategaethau hyn yn ychwanegu at y corff o lenyddiaeth cyfyngedig sydd ar gael yn y maes seicoleg hwn, a gall y canlyniadau gyfrannu tuag at ddatblygu holiaduron pellach yn y maes hwn.

Pwy sy'n gwneud yr ymchwil hwn a pham?

Mae'r prosiect yn rhan o brosiect ymchwil doethuriaeth Ruhina Ladha (Seicolegydd Clinigol dan hyfforddiant gyda Rhaglen Seicoleg Glinigol Gogledd Cymru), gyda chefnogaeth Prifysgol Bangor a dan oruchwyliaeth Dr Kristina Cole (Seicolegydd Clinigol). Mae'r ddau ymchwilydd yn aelodau o'r Gymdeithas Seicolegol Brydeinig. Mae'r astudiaeth wedi cael ei chymeradwyo gan Bwyllgor Moeseg Ymchwil Prifysgol Bangor.

Pwy all gymryd rhan?

Ar hyn o bryd, mae'r astudiaeth ar agor i oedolion 18 oed neu hŷn.

Beth a ofynnir i mi ei wneud?

Gofynnir i chi gwblhau cyfres o dri holiadur byr am eich ymddygiad mewn sefyllfaoedd cymdeithasol ac ynghylch nodweddion ASD a phryder cymdeithasol. Ni fwriedir i'r rhain fod yn ddiagnostig.

Pan fyddaf wedi cymryd rhan, a oes modd i mi newid fy meddwl?

Oes. Gellwch dynnu allan unrhyw amser, ac am unrhyw reswm, ac ni ofynnir i chi esbonio'r rhesymau dros dynnu allan. Cysylltwch â Ruhina os byddwch yn dymuno tynnu eich ymatebion yn ôl. Fodd bynnag, pan fydd yr ymchwil wedi cael ei gyflwyno (Mai/Mehefin 2018), ni fydd modd tynnu eich data unigol allan o'r ymchwil. Os na fyddwch yn cwblhau'r arolwg, bydd eich holl atebion yn cael eu dileu.

Pa mor hir fydd hyn yn ei gymryd?

Ni ddylai cwblhau'r holiaduron gymryd mwy na 15-25 munud.

A fydd fy rhan yn yr astudiaeth hon yn cael ei chadw'n gyfrinachol?

Bydd, rydym yn sicrhau cyfrinachedd y rhai sy'n cymryd rhan. Ni ofynnir am wybodaeth i'ch adnabod a bydd yr holl ddata yn cael ei storio'n ddiogel.

Mae gennyf fwy o gwestiynau; â phwy ddylwn i gysylltu?

Cysylltwch â'r prif ymchwilydd gydag unrhyw gwestiynau: Ruhina Ladha, Seicolegydd Clinigol Dan Hyfforddiant, NWCPP, Prifysgol Bangor, psp6b1@bangor.ac.uk

Dr Kristina Cole, Seicolegydd Clinigol (goruchwylydd), Kristina.Cole@wales.nhs.uk

Os byddwch yn dewis cysylltu, cedwir eich manylion yn gyfrinachol a byddant yn cael eu storio'n ddiogel a'u dinistrio wedi i'r astudiaeth ddod i ben.

Diolch yn fawr i chi am eich cymorth gyda fy mhrosiect. Ruhina Ladha

Ethics Appendix F: English and Welsh Consent Form Pages.

Page 2: Informed Consent

Please read the following statements and select 'yes' if you agree to take part.

Rllenwch y datganiadau canlynol a dewiswch 'yes' os byddwch yn cytuno i gymryd rhan.

The purpose and details of this study have been explained to me. I understand that this study is designed to further scientific knowledge and that all procedures have been approved by the Bangor University Ethics Committee / Esboniwyd pwrpas a manylion yr astudiaeth hon i mi. Rwy'n deall bod yr astudiaeth hon wedi'i chynllunio i ychwanegu at wybodaeth wyddonol a bod yr holl weithdrefnau wedi'u cymeradwyo gan Bwyllgor Moeseg Prifysgol Bangor.

I have had an opportunity to ask questions about my participation. / Rydw i wedi cael y cyfle i ofyn cwestiynau am fyrhan.
I understand that I am under no obligation to take part in the study, have the right to withdraw from the study at any stage for any reason and will not be required to explain my reasons for withdrawing. / Rwy'n deall nad oes rheidrwydd arnaf i gymryd rhan yn yr astudiaeth hon, mae gen i hawl i dynnu allan o'r astudiaeth unrhyw bryd ac am unrhyw reswm ac ni fydd angen i mi esbonio fy rhesymau dros dynnu allan.
I understand that I can ask to withdraw my answers until the research has been submitted in May/June 2018. / Rwy'n deall y gallaf ofyn am gael tynnu fy atebion allan o'r ymchwil hyd nes bydd yn cael ei gyflwyno ym Mai/Mehefin 2018.
I understand that any personal information I provide will be treated in strict confidence and will be kept anonymous and confidential to the researchers. / Rwy'n deall bydd unrhyw wybodaeth bersonol rwy'n ei darparu'n cael ei thrin yn hollol gyfrinachol ac fe'i cedwir yn hollol ddienw a chyfrinachol i'r ymchwilwyr.

I have read and understood the information page and this consent form. / Rwyf i wedi darllen a deall y daflen wybodaeth a'r ffurflen gydsynio hon.
I agree to take part in this study. / Rwy'n cytuno i gymryd rhan yn yr astudiaeth hon.

Ethics Appendix G: Demographic Questions Page.

Page 3: Demographic Information

Please indicate your age below
Please indicate your gender below
If you selected other, please feel free to give further details below Optional
What is your nationality?
Do you have an Autism Spectrum Condition e.g. Aspergers Sydrome, Autism, Autism Spectrum Disorder?
If yes, was this formally diagnosed - by a healthcare team, clinical psychologist or medical professional; or non-formally diagnosed - self-diagnosis, diagnosis from another source?
Do you have a current diagnosis of depression?
Do you have a current diagnosis of social anxiety?

Ethics Appendix H: Autism Spectrum Quotient (AQ-10).



AQ-10

Autism Spectrum Quotient (AQ)

A quick referral guide for adults with suspected autism who do not have a learning disability.

	Please tick one option per question only:	Definitely agree	Slightly agree	Slightly disagree	Definitely disagree
1	I often notice small sounds when others do not.				
2	I usually concentrate more on the whole picture, rather than the small details.				
3	I find it easy to do more than one thing at once				
4	If there is an interruption, I can switch back to what I was doing very quickly				
5	I find it easy to 'read between the lines' when someone is talking to me				
6	I know how to tell if someone listening to me is getting bored				
7	When I'm reading a story I find it difficult to work out the characters' intentions				
8	I like to collect information about categories of things (e.g. types of car, bird, train, plant etc.)				
9	I find it easy to work out what someone is thinking or feeling just by looking at their face				
10	I find it difficult to work out people's intentions				

SCORING: Only 1 point can be scored for each question. *Score 1 point for Definitely or Slightly agree on each of items 1, 7, 8, and 10. Score 1 point for Definitely or Slightly Disagree on each of items 2, 3, 4, 5, 6, and 9. If the individual scores more than 6 out of 10, consider referring them for a specialist diagnostic assessment.*

This test is recommended in 'Autism: recognition, referral, diagnosis and management of adults on the autism spectrum' (NICE clinical guideline CG142). www.nice.org.uk/CG142

Key reference: Allison C, Auyeung B, and Baron-Cohen S, (2012) *Journal of the American Academy of Child and Adolescent Psychiatry* 51(2):202-12.





Ethics Appendix I: The Conscious Social Strategies Questionnaire (CSSQ).

Conscious Social Strategies Questionnaire

This is a questionnaire designed to look at social strategies some people use to manage social situations. Some people only use one or two of these and others use many.

Please mark in the boxes below to indicate how often you feel the statement is true for you.

	Always	Often	Sometimes	Never
I behave naturally around other people				
I rely on others to tell me what to say or do socially				
I do research in order to understand how to behave socially				
I deliberately change my voice to fit in better with others				
I try to find a quiet place to deter people from talking to me				
I express my thoughts openly and honestly with others				
I rely on social media (e.g. YouTube, online forums) to learn what to say or do in social situations				
I like to start conversations with new people				
I try to blend in so as to go unnoticed by others				
I use films and TV to help me learn what to say or do socially				
I behave differently around other people				
I observe and copy the communications of others to help me fit in socially				
I have developed 'rules' to help me manage conversations better e.g. 'notice when I'm talking too much'				
I avoid groups of people when I can				
I try to behave as 'true to myself' when with others				
I put up barriers to stop people talking to me (e.g. keep head down, wear headphones, read a book, avoid eye				
contact) I make a conscious effort to make eye contact				
I do not hide who I am when I am interacting with others				

I pretend to be someone else e.g. a		
fictional character or someone I know		
who is confident, to help me in social		
situations		
I do not have to make a conscious effort		
to fit in		
I observe the body language of others to		
help me judge what to say or do		
When in public, I try not to engage in		
movements that others would consider		
strange		
I do not put on an act in social situations		
New social situations are enjoyable for me		
I practice at home to prepare for social		
situations e.g. facial expressions,		
conversation topics		
I laugh and pretend to understand jokes		
even when I don't		
I do not copy others in social situations		
Being around others is not effortful for me		

Do you consciously use any other social strategies that are not listed above? If so, could you please describe what these are?

Social Interaction Anxiety Scale (SIAS)

	Page 1 of 1
Patient Name:	_Date:

Instructions: For each item, please circle the number to indicate the degree to which you feel the statement is characteristic or true for you. The rating scale is as follows:

- 0 = **Not at all** characteristic or true of me.
- 1 = **Slightly** characteristic or true of me.
- 2 = **Moderately** characteristic or true of me.
- 3 = **Very** characteristic or true of me.
- 4 = **Extremely** characteristic or true of me.

CHARACTERISTIC	NOT AT ALL	SLIGHTLY	MODERATELY	VERY	EXTREMELY
I get nervous if I have to speak with someone in authority (teacher, boss, etc.).	0	1	2	3	4
2. I have difficulty making eye contact with others.	0	1	2	3	4
I become tense if I have to talk about myself or my feelings.	0	1	2	3	4
I find it difficult to mix comfortably with the people I work with.	0	1	2	3	4
5. I find it easy to make friends my own age.	0	1	2	3	4
6. I tense up if I meet an acquaintance in the street.	0	1	2	3	4
7. When mixing socially, I am uncomfortable.	0	1	2	3	4
8. I feel tense if I am alone with just one other person.	0	1	2	3	4
9. I am at ease meeting people at parties, etc.	0	1	2	3	4
10. I have difficulty talking with other people.	0	1	2	3	4
11. I find it easy to think of things to talk about.	0	1	2	3	4
12. I worry about expressing myself in case I appear awkward.	0	1	2	3	4
I find it difficult to disagree with another's point of view.	0	1	2	3	4
14. I have difficulty talking to attractive persons of the opposite sex.	0	1	2	3	4
15. I find myself worrying that I won't know what to say in social situations.	0	1	2	3	4
16. I am nervous mixing with people I don't know well.	0	1	2	3	4
17. I feel I'll say something embarrassing when talking.	0	1	2	3	4
18. When mixing in a group, I find myself worrying I will be ignored.	0	1	2	3	4
19. I am tense mixing in a group.	0	1	2	3	4
I am unsure whether to greet someone I know only slightly.	0	1	2	3	4

Ethics Appendix K: English and Welsh Debrief Pages.

Debrief

Thank you for completing this study. This study is exploring the associations between the conscious social strategies people use, social anxiety and Autism Spectrum Disorder (ASD).

Why is this important?

ASD is a social communication disorder, where people often miss social cues or respond differently to them e.g. not wanting to make eye contact. Recent research has found that many women with ASD report 'camouflaging' behaviours – strategies they consciously use to try and fit in better socially with others e.g. copying other people's behaviour, laughing at jokes they don't understand. This can mean women with ASD get diagnosed later and/or their ASD is unnoticed by others, meaning they often don't get the support they need. Current research is looking into ways camouflaging can be measured formally by professionals, so that these behaviours can be noticed and people with ASD can be supported more quickly and effectively. We hoped to do this in our study, by creating a questionnaire looking into camouflaging behaviours. We wanted to see if people of all genders, with and without ASD use such strategies as well.

How was this done?

You completed questionnaires looking at classic autistic traits — with the Autism Spectrum Quotient (AQ)-10 and the Conscious Social Strategies Questionnaire (CSSQ) looking at different types of camouflaging behaviours. This allows us to measure if there is a correlation between the two. We also asked about your levels of social anxiety - through the Social Interaction Anxiety Scale. This is because the research around social anxiety suggests that people who experience this problem are likely to want to avoid social situations and may therefore also use some of the same strategies as people with ASD. By measuring this, we can investigate if there is any overlap between the conditions.

What do we expect to find?

We expect that people who score higher on levels of autistic traits, particularly women, will also score higher on camouflaging behaviours. We also expect that people who score higher on social anxiety, will score higher on avoidance-related camouflaging behaviours. We are also interested in exploring whether there is a difference between people of different genders on these measures.

What if I want to knowmore?

If you are interested in learning more about camouflaging and/or ASD, you may want to consult:

Bargiela, S., Steward, R., & Mandy, W. (2016). The experiences of late-diagnosed women with autism spectrum conditions: an investigation of the female autism phenotype. *Journal of autism and developmental disorders*, *46*(10), 3281-3294.

The National Autistic Society - www.autism.org.uk - +44 (0)20 7833 2299

ASD Info Wales - http://www.asdinfowales.co.uk/home/ - 029 2046 8675

If you would like to ask any more questions and/or receive a one page summary of the findings from this study, please contact the main investigator: Ruhina Ladha, Bangor University, psp6b1@bangor.ac.uk

I feel distressed by this study, who do Ispeak to?

If you feel distressed by any of the content in this study, you can contact the researchers: Ruhina Ladha, Trainee Clinical Psychologist, North Wales Clinical Psychology Programme psp6b1@bangor.ac.uk

Dr Kristina Cole, Chartered Clinical Psychologist, Kristina.Cole@wales.nhs.uk

For those in the UK, you can also get in touch with a mental health organisation such as MIND (https://www.mind.org.uk)

If you choose to get in contact, your details will be kept confidential, stored securely and destroyed after the study has ended.

You are also advised to speak to your GP or local health professional.

Thank you again for your participation.

Taflen Adroddiad

Mae'r astudiaeth yn archwilio'r cysylltiadau rhwng y strategaethau cymdeithasol ymwybodol a ddefnyddir gan bobl, pryder cymdeithasol ac Anhwylder Sbectrwm Awtistiaeth (ASD).

Pam bod hyn yn bwysig?

Mae ASD yn anhwylder cyfathrebu cymdeithasol, lle mae pobl yn aml yn methu awgrymiadau neu'n ymateb yn wahanol iddynt e.e. ddim eisiau gwneud cyswllt

Ilygad. Mae ymchwil diweddar wedi darganfod bod llawer o ferched sydd ag ASD yn adrodd ymddygiad 'cuddliwio' - strategaethau maen nhw'n eu defnyddio'n ymwybodol i geisio ffitio'n well yn gymdeithasol ag eraill e.e. copïo ymddygiad eraill, chwerthin ar jôc nad ydynt yn ei deall. Gall hyn olygu bod merched ag ASD yn cael diagnosis yn hwyrach ac/neu nid yw eraill yn sylwi ar eu ASD, sy'n golygu nad ydynt yn aml yn derbyn y gefnogaeth angenrheidiol. Mae ymchwil gyfredol yn edrych ar ffyrdd gall cuddliwio gael ei fesur yn ffurfiol gan broffesiynolion, fel bo modd sylwi ar ymddygiad fel hyn a bydd pobl ag ASD yn derbyn cefnogaeth yn gynt ac yn fwy effeithiol. Rydym yn gobeithio gwneud hyn yn ein hastudiaeth, drwy greu holiadur sy'n edrych ar ymddygiad cuddliwio. Rydym am weld a yw pobl o bob rhyw sydd ag ASD neu hebddo, yn defnyddio strategaethau fel hyn hefyd.

Sut gwnaed hyn?

Fe wnaethoch gwblhau holiaduron yn edrych ar nodweddion awtistiaeth clasurol - gyda'r Cyniferydd Sbectrwm Awtistiaeth (AQ) - 10 a'r Holiadur Strategaethau Cymdeithasol Ymwybodol (HSCY) yn edrych ar wahanol fathau o ymddygiad cuddliwio. Mae hyn yn ein galluogi i fesur a oes cydberthynas rhwng y ddau. Gwnaethom ofyn hefyd am eich lefelau o bryder cymdeithasol - drwy'r Gyfradd Pryder Rhyngweithio Cymdeithasol. Mae hyn oherwydd bod yr ymchwil o gwmpas pryder cymdeithasol yn awgrymu bod pobl sy'n cael y broblem hon yn debygol o fod eisiau osgoi sefyllfaoedd cymdeithasol ac felly o bosibl yn defnyddio rhai o'r un strategaethau a phobl ag ASD. Drwy fesur hyn, gallwn archwilio a oes unrhyw orgyffwrdd rhwng y ddau gyflwr.

Beth rydym yn disgwyl ei ddarganfod?

Rydym yn disgwyl i bobl sy'n cael sgôr uwch ar lefelau nodweddion awtistig, yn enwedig merched, sgorio'n uwch hefyd ar ymddygiad cuddliwio. Rydym hefyd yn disgwyl i bobl sy'n cael sgôr uwch ar bryder cymdeithasol gael sgôr uwch hefyd ar ymddygiad cuddliwio sy'n ymwneud ag osgoi. Rydym hefyd â diddordeb mewn archwilio a oes unrhyw wahaniaeth rhwng pobl o wahanol ryw ar y mesurau hyn.

Beth os hoffwn gael gwybod mwy?

Os oes gennych ddiddordeb mewn dysgu mwy am guddliwio a/neu ASD, efallai yr hoffech edrych ar:

Bargiela, S., Steward, R., & Mandy, W. (2016). The experiences of latediagnosed women with autism spectrum conditions: an investigation of the female autism phenotype. *Journal of autism and developmental disorders*, 46(10), 3281-3294.

The National Autistic Society - www.autism.org.uk - +44 (0)20 7833 2299

ASD Info Cymru -

http://www.asdinfowales.co.uk/home.php?page_id=1&setLanguage=4_- 029 2046 8675

Os hoffech ofyn unrhyw gwestiynau pellach a/neu dderbyn crynodeb un dudalen am ddarganfyddiadau'r astudiaeth hon, cysylltwch â'r prif ymchwilydd: Ruhina Ladha, Prifysgol Bangor, psp6b1@bangor.ac.uk

Dw i'n teimlo'n ofidus oherwydd yr astudiaeth hon, â phwy ddylwn i siarad?

Os ydych yn teimlo'n ofidus oherwydd unrhyw gynnwys yr astudiaeth hon, gellwch gysylltu â'r ymchwilwyr: Ruhina Ladha, Seicolegydd Clinigol Dan Hyfforddiant, Rhaglen Seicoleg Glinigol Gogledd Cymru psp6b1@bangor.ac.uk

Dr Kristina Cole, Seicolegydd Clinigol Siartredig, Kristina.Cole@wales.nhs.uk

I'r rhai sydd yn y DU, gellwch hefyd gysylltu â sefydliadau iechyd meddwl megis MIND (https://www.mind.org.uk)

Os byddwch yn dewis cysylltu, cedwir eich manylion yn gyfrinachol a byddant yn cael eu storio'n ddiogel a'u dinistrio wedi i'r astudiaeth ddod i ben.

Fe'ch cynghorir hefyd i siarad gyda'ch MT neu'ch proffesiynolyn iechyd lleol.

Diolch yn fawr i chi eto am gymryd rhan.

General Thesis Appendix A: One Page Summary for Participants.

<u>The Conscious Social Strategies Questionnaire (CSSQ) – exploring a new self-report</u>

measure of 'camouflaging'

Ruhina Ladha and Dr Kristina Cole

Aims

The purpose of this project was to develop a questionnaire to identify the nature and prevalence of the conscious social strategies (or social 'camouflaging' behaviours) people use. We also looked at how the use of these strategies corresponded to levels of social anxiety and traits of Autism Spectrum Disorder (ASD).

Methods

Data for the study was collected online. 247 participants completed three questionnaires – the Autism Spectrum Quotient-10 (a measure of ASD traits), the Social Interaction Anxiety Scale (a measure of social anxiety) and the initial version of the CSSQ.

Findings

Exploratory factor analysis led to the development of a shorter, refined version of the CSSQ. Four types of conscious social strategies emerged - masking strategies, avoidance strategies, an absence of strategies and compensatory strategies. We also found that people who engaged in more camouflaging, also reported higher levels of social anxiety and traits of ASD.

Conclusions

The CSSQ has the potential to be useful in further investigating levels of camouflaging behaviour in clinical and non-clinical populations. More research is necessary to further validate the measure and explore the effect of other factors e.g. gender and mental health symptomology, on levels of conscious social strategy use.

Thank you again for participating in this research

General Thesis Appendix B: Word Count Statement.

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Word count excluding tables, figures, reference lists and appendices	16508
Appendices including tables, figures and reference lists, excluding ethics appendices	7301
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