Autism Spectrum Conditions; the Age of, Recency of and Lack of Diagnosis.

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Very little is known about autism spectrum conditions in adulthood, especially those that are diagnosed late in life or self-diagnosed; let alone how they were not diagnosed earlier or at all. As a relatively new subset of autistic people, it is also unclear how the timing and recency of an autism diagnosis might affect an individual. This research explores relationships between a range of cognitive, behavioural and mental health variables and the age and recency of a person's diagnosis or self-diagnosis to address three questions; 1. Do individuals who received a diagnosis of an ASC in childhood differ in a range of variables from those who realised they are autistic as adults? (the age of autism diagnosis) 2. Do those without official diagnoses differ from those with official diagnoses? (the lack of diagnosis) 3. What role, if any, does the time elapsed since diagnosis or self-diagnosis of ASC play in these results? (the recency of diagnosis). A total of 409 clinically diagnosed autistic and self-diagnosed autistic people participated across three separate online surveys. Consistent findings across all studies show relationships between autistic traits and the time elapsed since diagnosis, as well as significant differences between diagnosed and self-diagnosed participants in levels of autistic traits, as measured with both the Autism Spectrum Quotient and the short Ritvo Autism and Asperger Diagnostic Scale. A significant difference in working memory between those diagnosed aged 18 or younger and those diagnosed over 18 was also found. Also, levels of camouflaging were found to be higher in participants without an official diagnosis. Implications arising from this

research include greater awareness of the diagnostic and post-diagnostic needs of autistic people across their lifespan.

CONTENTS

Autism Spectrum Conditions; the Age of, Recency of and Lack of Diagnosis.

Autism spectrum condition (ASC; the preferred term for autism spectrum disorder, see Lai & Baron-Cohen, 2015), is a neurodevelopmental condition that is characterised by social-communication difficulties and restricted, repetitive behaviours and interests (RRBIs) (American Psychological Association, 2020).[1] First described in the 1940s (for example, Kanner, 1943), infantile autism appeared in the first edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM) in 1952 in relation to schizophrenia (Herman, 2021). Subsequent editions added more information and diagnostic criteria and, in 2013, the DSM-5 merged the previous subcategories of Autistic Disorder; Asperger Syndrome, Pervasive Developmental disorder not otherwise specified, and Rett Syndrome and Childhood Disintegrative Disorder into the autism spectrum. Often referred to just as autism, the DSM-5 suggests assigning a support level to diagnoses. These levels range from one to three, with level one autistic people requiring support, level two requiring substantial support and level 3 requiring very substantial support.

Autism is present in an individual by the age of three (Park et al., 2016), and a number of tools currently exist to identify the condition as young as possible. In the UK, children who are suspected of being autistic are firstly screened using a parent report instrument such as the modified checklist for autism in toddlers or the childhood autism spectrum test. Depending on the outcome of these screening measure(s), the child might be referred to a diagnostic team usually comprised of two or more professionals, such as a paediatrician and a psychologist. This multi-disciplinary team would then use one or more diagnostic tool(s) to investigate the child's behaviour. The most common of these tools; the Diagnostic Interview for Social and Communication Disorders (DISCO), the Autism Diagnostic Interview – Revised (ADI-R) and the

[1] This thesis uses identity-first language in regard to autism as evidence suggests this is preferred by the majority of autistic people (see Bury, Jellett, Spoor & Hedley, 2020; Botha, Hanlon & Williams, 2020) as well as the author's personal preference.

Autism Diagnostic Observation Schedule (ADOS), are used to diagnose all ages from toddlers to adults (National Autistic Society, 2020).

Given the neurodevelopmental nature of ASC, and well-evidenced links between early diagnosis and improved life outcomes (for example, Volkmar, 2014), it is not surprising that the majority of research focuses on children. However, the number of published studies about autism is rising exponentially (Happé & Frith, 2020), and a lot of this research looks at autistic adults. ASC is estimated to affect between 1% and 3% of the population (National Autistic Society, 2021; Wright, 2018). An exact figure has proved elusive, most likely due to changes in diagnostic criteria (Johnson & Meyer, 2007), a well-documented gender disparity (males > females; Johnson & Meyer, 2007; Attwood, 2006) and an increasing number of adult diagnoses (Lai & Baron-Cohen, 2015). Based on the prevalence of ASC in children, Baron-Cohen and colleagues (2009) estimated that for every three adults that receive a diagnosis of autism, two remain undiagnosed.

Late and Undiagnosed Adults

Referring to them as "the lost generation of adults with autism spectrum conditions" in their landmark paper, Lai and Baron-Cohen (2015) were among the first to look into this under researched group. Their review focused on the difficulties of adequately identifying a developmental difference in adults, including clinical problems such as comorbid and co-occurring diagnoses and more practical issues, such as the tendency of undiagnosed autistic people to find a role in life that fits their autistic needs and allows them to function seemingly as normal. However, those that appear to function normally are the minority as figures suggest that only 21.7% of autistic adults are currently employed (Office for National Statistics, 2021), although many would like to be. With the financial cost of supporting an autistic person throughout their lifetime estimated to be between £0.80 million and £1.23 million (Knapp, Romeo & Beecham, 2009), the potential economic cost of leaving people undiagnosed (and

thus without access to support services) - might be even higher than previously estimated. Of course, the personal and social price of failing to diagnose genuine cases is likely to be even more significant than the corresponding economic cost (Bargiela, Steward & Mandy, 2016).

The majority of research on adults with late ASC diagnoses is qualitative. Whilst this type of research can provide a rich insight into an ever growing, dynamic subset of society, it is not possible to extrapolate results to populations other than the study sample. Despite the heterogeneity of the ASC population, several common themes arise from the qualitative research including feeling different or 'othered' (Stagg & Belcher, 2019; Lewis, 2016) and how the diagnosis has been useful in both improving well-being and creating a new identity (Stagg & Belcher, 2019; Leedham et al., 2019), something years of 'masking' can detrimentally affect (see section 'Behaviour and camouflaging' for a definition of masking). Although described as painful by participants in Leedham et al.'s (2019) interpretative phenomenological analysis, many agreed that the greater understanding and acceptance of themselves was a positive thing. This process can be likened to the adjustment in the wake of an acquired condition or disability, described by Frank (1993). By its nature qualitative research is subjective and focuses on 'lived experience', as indicated in Coleman-Smith, Smith, Milne and Thompson's (2020) work. While this is important, qualitative research provides little, or no, insight about the mechanisms underpinning the ability to effectively evade suspicion of neurodiversity.

Autistic Identity and Self-Diagnosis of ASC

A recent study by Corden, Brewer and Cage (2021) was the first published paper looking at the effect of age of ASC diagnosis on an individual's wellbeing and identity. Although the age of diagnosis was not significantly related to other variables examined, the *recency* of the diagnosis was found to be strongly related to how an individual viewed themselves as an autistic person. This, in turn, affected their wellbeing and self-esteem. The researchers noted a "post-diagnostic adjustment process" (p. 4) in which participants described both positive and

negative emotions whilst re-evaluating their lives and coming to terms with the permanent nature of their difficulties. However, although this research was sufficiently powered, an overwhelming majority of women makes the sample less representative of a group traditionally comprised of more men. This study also omitted self-diagnosed people and whilst it is entirely possible that not all self-diagnosed people are actually autistic, Corden and colleague's sample was arguably limited.

The idea of creating a new, 'autistic' identity is believed to have led to the creation of a subset of the 'lost generation', namely self-diagnosed adults, formerly known as autistic cousins (Giles & Newbold, 2011; Brownlow & O'Dell, 2006). With common ASC screening tools such as the Autism-spectrum Quotient (Baron-Cohen, Wheelwright, Skinner, Martin & Clubley, 2001) freely available online, undiagnosed adults who have either not yet managed to begin the diagnostic journey or do not care about formal clarification, as well as those already on what can be several years of waiting lists for adult investigation, are increasingly adopting the autistic label. This phenomenon of self-diagnosis appears to be unique to adults who believe they have ASC or attention deficit hyperactivity disorder (ADHD; Sarrett, 2016). This is a contentious issue among diagnosed autistic people, clinicians and academics.

According to Sarrett's paper (2016) many autistic people understand practical difficulties getting a diagnosis of ASC from a recognised professional. However, others feel that self-diagnosis is a way of misappropriating the struggle of diagnosed autistic people. With the majority of autism charities and services being run by non-autistic people, and many non-autistic people describing themselves as autistic advocates, it is unsurprising that authenticity is important to the autistic community. This is especially true because specific difficulties associated with being autistic often prevent autistic people from advocating for themselves or fellow autistics.

Although described as “begging to be researched and understood by professionals” (Lewis, 2016a, p. 576) there is hardly any literature on the self-diagnosed. This is perhaps in part due to requirements that researchers verify a person’s ASC diagnosis and exclude those without formal diagnoses. The limited existing research on the topic suggests that although adults generally self-diagnose for an average of 3.25 years before receiving official diagnosis (Lewis, 2016b), those that currently describe themselves as self-diagnosed report significantly less RRBIs than their diagnosed counterparts (Brosnan, 2020). Brosnan’s sample of self-diagnosed adults did, however, self-report similar levels of social-communication difficulties as those with full diagnoses. Given the high levels of difficulty described by adults who received late diagnoses, including increased risk of suicide (Cassidy & Rodgers, 2017), it is important to investigate this population of self-diagnosed adults to establish other similarities and differences and therefore how they can best be helped.

The evidence alludes to a number of possible reasons why the presentation of some individuals allows them to go undiagnosed, sometimes into late adulthood. Candidate explanations that this study will investigate are a) co-occurring issues including anxiety, depression and alexithymia, b) social explanations such as camouflaging and c) cognitive theories, namely theory of mind and executive function differences.

a) Late Diagnosis and Mental Health

One of the most frequently proposed explanations why ASC is not detected in some individuals until adulthood concerns the presence of cooccurring mental health conditions. This is often because the symptoms of the mental health condition are similar to autistic traits. For example, an autistic person’s fussy eating habits might be easily mistaken for obsessive compulsive disorder (OCD) or difficulties in social interaction could be misdiagnosed as social anxiety disorder. In an investigation of 12 case reports of adults who had been diagnosed with ASC aged between 17 and 50 (mean age of ASC diagnosis = 24.75 years) and had previously

been misdiagnosed, Luciano et al. (2014) described each individual's original symptoms as well as possible reasons for their misdiagnosis. Onset symptoms of ASC tended to be misdiagnosed as various personality disorders, or (when repetitive behaviour was a feature) as OCD. The possible reasons for misdiagnosis tend to involve clinicians not looking at the wider picture of the individual's life as a whole. Whilst Luciano and colleagues' sample is too small to guarantee generalisable results, the research does highlight the need for diagnosticians to have a fuller understanding of adult ASC (e.g., in the absence of ASC biomarkers, diagnoses are based on clinical judgement of behaviour).

High levels of anxiety have been recorded in autistic people of all ages (Kanner, 1943; Buck et al., 2014). This is often down to fears common among neurotypicals (NTs) and the neurodiverse (ND), such as adverse weather or scary films. Around 50% of the time for autistic people however, the cause of the anxiety is specific to their condition (Lau et al., 2020). Common causes are, for example, sensory pressures and triggers or the need to maintain certain behavioural patterns. Another frequent comorbid disorder, depression, is often what brings an undiagnosed autistic adult to the attention of mental health professions. Late diagnosed adults tend to have higher rates of psychiatric consultations than their neurotypical counterparts (Lehnhardt et al., 2011). Lehnhardt and colleague's findings echo detailed descriptions of abuse provided by late diagnosed autistic women, the majority of whom report having experienced mental health issues at some point in their lives (Bargiela, Steward & Mandy, 2016).

The differential diagnosis issue is further confounded by the relationship between ASC and alexithymia; problems with understanding and describing one's own feelings (Bird & Cook, 2013). Although alexithymia is not currently classified as a mental health disorder or illness, with the majority of research referring to it as a personality trait, its positive association with depression and anxiety is well established (Marchesi, Brusamonte & Maggini, 2000).

Individuals who are high in autistic traits also report high levels of alexithymia (Kinnaird, Steward & Tchanturia, 2020). This pattern is seen in participants who meet the diagnostic criteria for ASC as well as those who fall short (Nishida, 2015). This ASC-Alexithymia relationship might explain at least some of the misdiagnosis of autistic adults described by Lai and Baron-Cohen (2015), with individuals not understanding or recognising traits that are associated with ASC. Autistic traits correlate positively with measures of depression, anxiety and alexithymia (Albantakis et al., 2018; Lai et al., 2019; Kinnaird, Steward & Tchanturia, 2020).

b) Behaviour and Camouflaging

There is a strong link between age of diagnosis of ASC and learning disabilities (LDs), with children with LDs being investigated earlier than those without LDs, who might not come to the attention of their school or families at all (Brett et al., 2016; Mishaal et al., 2014; Hosozawa et al., 2020). Although the term 'learning disabilities' covers a wide range of cognitive differences, and is therefore hard to quantify, the prevalence of LD comorbidity with ASCs has fallen since the 1990s (Johnson & Meyers, 2007). This suggests a rise in level 1 ASCs (previously referred to as High Functioning Autism or Asperger's Syndrome), where little support is needed. Diagnostic subtype has been directly implicated as a factor in age of diagnosis in children (Ouellette-Kuntz et al., 2009). Evidence also proposes that the more aggressive or unruly a child's behaviour is, the more likely they are to be put forward for ASC screening (Zwaigenbaum et al., 2019). This pattern, which has been noted in several countries (Gibbs et al., 2019; Kurasawa et al., 2018) ties in with gender stereotypes that one could argue have led to more boys being diagnosed with ASC than girls (Attwood, 2006). Higher levels of gender fluidity in the autistic population also adds doubt to overly gendered screening methods, with autistic people being more likely to report gender non-conforming feelings (Dewinter, De Graaf & Beger, 2017).

The development of the female autism phenotype (see Hull, Petrides & Mandy, 2020) has identified a need for a greater understanding of the concept of camouflaging. Also known as masking, the sometimes unconscious process of disguising autistic behaviour to appear more neurotypical (NT) or non-autistic, has been proposed as one reason ASC adults, especially women, can go undiagnosed for so long (Pearson & Rose, 2021; Hull et al., 2020). Hull and colleagues' (2017) seminal paper on social camouflaging in autistic adults proposed a three-stage model of camouflaging, starting with the motivations behind hiding certain behaviours cited as being a desire to fit in and connect. The second stage examined the mechanisms of camouflaging, such as advance planning of social interactions and conversations. The final stage, the consequences of camouflaging, highlights how it can be damaging, both psychologically and physically, with exhaustion being the most frequently cited drawback. As a relatively newly recognised phenomena, there is little research on the cognitive mechanisms behind the ability to disguise traits and RRBIs and how these fit in with established theories on ASC, such as the apparent deficit in theory of mind, the ability to attribute mental states to others (Bora, Bartholomeusz & Pantelis, 2015).

Camouflaging has been found to correlate positively with autistic traits (Hull et al., 2017). Studies exploring the relationship of camouflaging with anxiety and depression indicate a strong positive association (Hull et al., 2017; Cage, Di Monaco & Newell, 2018), with the stresses of camouflaging thought to be adding to suicidal risk in autistic people. Whilst there is no current literature on the relationship between camouflaging and alexithymia, Schuck, Flores and Fung (2019) investigated emotional expressivity, as measured with the Berkley Expressivity Questionnaire, which is arguably a theoretically similar construct to alexithymia. They found that emotional expressivity correlated negatively with camouflaging, measured using standardised autism-spectrum quotient and ADOS scores, in autistic women but not men. This finding supports existing evidence that women camouflage their autistic traits more than men.

c) Theory of Mind and Working Memory

Cognitively, ASC has been linked to a number of deficits, most notably in theory of mind (ToM). First proposed by Premack and Woodruff (1978), ToM refers to an individual's ability to infer mental states in oneself and others in order to explain and predict behaviour. Also referred to as mentalizing, it is posited to be a contributory cause of the social-communication difficulties experienced by those on the spectrum (e.g., Brunsdon & Happé, 2014). Studies have repeatedly shown that autistic children perform worse than their neurotypical counterparts on age-appropriate measures of ToM, such as false belief tests among children (Baron-Cohen, Leslie & Frith, 1985; Cantio, Jepsen, Madsen, Bilenberg & White, 2016) and the Reading the Mind in the Eyes task (RMIE; Baron-Cohen, Wheelwright, Hill, Raste & Plumb, 2001) among adults. The RMIE task can be easily administered online, often to large samples (e.g., Baron-Cohen and colleagues, 2015). The RMIE task presents participants with 36 photographs of sets of eyes and asks them to assign one of the four accompanying emotions to the picture by implying the mental state of the person pictured. A negative relationship between age and RMIE accuracy has been observed in typically developing adults (Kynast et al., 2020). However, there does not appear to be any research on how the age of ASC diagnosis might impact on the ability to understand others by their eyes. Previous research has identified a significant relationship between RMIE performance and alexithymia (Oakley, Brewer, Bird & Catmur, 2016).

Autistic children tend to score lower in executive function tests, including working memory (Bennetto, Pennington & Rogers, 1996; Williams, Goldstein & Minshew, 2006). Working memory; a system for managing and manipulating information in action (Cowan, 2014), is implied in numerous cognitive processes, across an individual's life span. With regards to working memory in autistic adults, a meta-analysis of 28 studies found significant impairment, especially in spatial rather than verbal working memory, in adults with ASC compared to NT

participants (Wang et al., 2017). However, this was not associated with age or age of diagnosis. Geurts and Vissers (2012) found that age had a larger effect on visual memory performance among their small autistic sample, than among their control group. Working memory is generally accepted to be an ability that naturally deteriorates with age (Craik & Salthouse, 2008); therefore, it could be hypothesised that whilst autistic adults will follow this general negative trend, late diagnosed participants will have better working memory than those diagnosed in childhood or adolescence.

Autistic traits correlate negatively with theory of mind tasks (Baron-Cohen, Wheelwright, Hill, Raste & Plumb, 2001) and working memory tests (Habib, Harris, Pollick & Melville, 2019). Theory of mind and working memory have a more complicated relationship with each other. Mutter, Alcorn and Welsh (2006) found working memory to be a significant predictor of false belief performance in children. Theory of mind has been found to mediate the relationship between anxiety and social communication impairments in autistic children aged 4 to 8 (Lei & Ventola, 2018). Crane, Goddard and Pring (2011) found that autistic adults reported higher levels of depression and lower ToM and WM abilities. Working memory and alexithymia also have a complicated relationship, with some studies suggesting WM deficits are at the heart of alexithymia (Frawley & Smith, 2001) and others noting no significant relationship (Koven & Thomas, 2010).

Anxiety and depression have both been linked to working memory problems (Darke, 1987; Christopher & MacDonald, 2010). Furthermore, a recent paper provided evidence that working memory training could help to alleviate anxiety and depression (Beloe & Derakshan, 2019). Although WM has been proposed as a mechanism behind camouflaging, the only quantitative study on the topic found no significant association between a measure of WM and the CAT-Q (Somerville, MacPherson & Fletcher-Watson, 2019, preprint).

The Current Studies

The studies in this thesis aimed to examine whether there is a relationship between age of ASC diagnosis or self-diagnosis, and seven main variables: autistic traits, ToM ability, working memory, camouflaging abilities, levels of depression, anxiety, and alexithymia. A set of five secondary independent variables was also used to investigate patterns in participant's childhood anxiety, depression, sensitivity to the environment, outgoingness and general behaviour. Given Corden, Brewer and Cage's (2021) findings that recency of diagnosis was a more important predictor of satisfaction with autistic identity than age of diagnosis and that an adjustment period happens after diagnosis, the current studies also analysed the length of time since diagnosis or self-diagnosis as a second dependent variable.

Study 1a explored those already diagnosed with ASC. It first hypothesised that a later age of diagnosis will be positively related to camouflaging abilities. It also posited a positive correlation between camouflaging and working memory as measured using a digit span task. Given the high levels of anxiety, depression and alexithymia reported by autistic people along with pressures associated with increased camouflaging and societal issues faced by undiagnosed adults, some who may not even know they are autistic, common measures of all three were expected to reveal higher levels in those diagnosed later in life. Furthermore, it is hypothesised that whilst current age will be a factor in RMIE performance, age of ASC diagnosis will provide a significant relationship.

Study 1b focused on adults without official diagnoses who consider themselves to be autistic. Due to the lack of existing quantitative research on self-diagnosed autistic people, it was expected that participants in Study 1b would score lower than the clinically diagnosed in all variables except those measuring theory of mind and working memory. There is not enough information available to indicate how self-diagnosed people will respond to the CAT-Q.

In general, it was expected that female participants will report a higher age of diagnosis, and therefore a lower time elapsed since diagnosis. In light of Corden et al.'s (2021) female heavy

sample, it was hypothesised that more women than men are likely to participate in the current studies, even though official figures still show a 3:1 Male to Female ratio of autism prevalence across 54 international studies (Loomes, Hull & Mandy, 2017).

At the time of writing no other study has identified differences, or similarities, in the particular traits used in these studies, between those diagnosed at a young age, the lost generation of autistic adults and those who are self-diagnosed. This is an important first step in establishing the effects, if any, of the age of ASC diagnosis and the time elapsed since diagnosis.

Study 1a & Study 1b Method

Participants

Study 1a participants were aged 18 or over and required an official diagnosis of ASC. One hundred and sixty participants responded to the link, though only 100 completed one or more scale/task, with 50 identifying their gender as Female, 37 as Male, 11 as Other and two choosing to not disclose. Thirty-seven participants reported that they were diagnosed in the UK, 31 in the US, 6 in Canada, 4 in Australia, with the remaining 22 being diagnosed in other countries or unable to remember (see Appendix A for full details). The age range was 18 – 68 years, with a mean average age of 37.41 (*SD* = 13.83). The range of age of diagnosis was 3 – 64 years old, with a mean age of diagnosis of 30.38 (*SD* = 16.48). Sixty per cent of participants reported having a diagnosis of anxiety, with 56% reporting diagnoses of depression and 22% reporting post-traumatic stress disorder (PTSD) diagnoses (see Appendix B for further diagnoses).

Study 1b participants were aged 18 or over and identified as being autistic or Asperger's but have no official diagnosis. One hundred and one participants responded with 50 identifying their gender as Female, 22 as Male, 28 as Other and one choosing to not disclose. The age range was 18 – 72, with a mean average age of 35.85 (*SD* = 12.60), whilst the range of age of self-diagnosis was between 7 and 59 years. Forty-one participants came from the US, 25 from the UK, 17 from Canada with the remaining 17 reporting that they are from different countries, including Brazil and New Zealand. See Appendix A for details.

All participation was voluntary. Participants were recruited via social media sites, such as Facebook pages and Twitter accounts using the #ActuallyAutistic hashtag, and forums that specialise in autism, including Wrong Planet.

Procedure

Data was collected via Qualtrics (Qualtrics, 2020), as a freely available internet survey. Participants responded to anonymous links to the website featuring the survey. Having clicked on the anonymous link, respondents saw a welcome message with instructions and explanation of the study. To ensure informed consent was granted by all respondents a forced response was used to allow them to continue with the survey. After completing the questions and measures, a debrief sheet was displayed, listing contact details for the lead researcher as well as helpline numbers. The survey stayed live for two months and took an average of 30 minutes to complete.

Materials

In Study 1a participants completed seven tasks and self- report questionnaires in the order described.

Demographics and Characteristics: The following information was gathered for each participant. Age of ASC diagnosis and current age were recorded, as well as details about the respondent's diagnosis, namely the location and specific diagnosis as an alternative to asking for proof of diagnosis. Levels of childhood depression, anxiety and sensitivity to the environment were measured on a scale of 1 to 10, e.g. "When you think about your childhood, how depressed do you remember feeling?". Levels of how well behaved and outgoing participants remembered being as children at home, school and in general were measured on a scale of 1 to 10 (e.g. "As a child, how well behaved were you?" with a scale ranging from "Very well behaved" to "Very naughty" for each of the three settings of home, school and in general) giving a total score out of 30 for both childhood behaviour and childhood sociability. Participants were also asked about their siblings, if they had any, their relative ages and whether they have any diagnoses of ASC. Gender was also recorded giving four options of Female, Male, Other and Prefer not to say.

Autism-Spectrum Quotient (AQ; Baron-Cohen, Wheelwright, Skinner, Martin & Clubley, 2001): The AQ is a 50-item scale to gauge the level of autistic traits an individual possesses. Each item has four possible responses; definitely agree, slightly agree, slightly disagree and definitely disagree. Higher scores indicate higher levels of autistic traits and a score >26 indicates a clinically significant presence of ASC traits (Woodbury-Smith, Robinson, Wheelwright & Baron-Cohen, 2005). The internal consistency in this sample was $\alpha = 0.74$.

Reading the Mind in the Eyes task (RMIE; Baron-Cohen, Wheelwright, Hill, Raste & Plumb, 2001): This is a measure of mentalising ability where participants are presented with 36 photographs of people's eyes and asked to choose which one of the four emotions listed best fits how the person in the photo was feeling. Each correct answer scores one point and higher scores are thought to indicate better mentalising ability. The original paper does not state the internal consistency, with some critics suggesting it is inadequate (Olderbak, Wilhelm, Olaru, Geiger, Brenneman & Roberts, 2015), however in this sample it was good ($\alpha = 0.86$).

Beck Depression Inventory (BDI-II; $\alpha = .92$, Beck, Brown & Steer, 1996): In the BDI-II participants are asked to pick one of four statements that best describes how they feel. There are 21 groups of statements that represent elements of depression, for example the four statements in the sadness group range from "I do not feel sad" to "I am so sad or unhappy that I can't stand it". Statements are scored from 0 to 3 with higher scores suggesting greater levels of depression. The following scoring guidelines have been suggested: 14-19 = mild depression, 20-28 = moderate depression and 29-63 = severe depression.

Beck Anxiety Inventory (BAI; $\alpha = .92$, Beck & Steer, 1993): The BAI is comprised of a list of 21 common symptoms of anxiety which requires participants to indicate how often they are bothered by that symptom (for example, Hands trembling) in the last month on a four-point scale ranging from "Not at all" to "Severely – it bothered me a lot". Scored from 0 to 3, high scores represent higher levels of anxiety.

Toronto Alexithymia Scale (TAS; α = .81, Bagby, Parker & Taylor, 1994): a 20 item self-report scale that measures difficulties in three intercorrelated factors; identifying and describing one's own feelings and externally oriented thinking. The first item, for example, "I am often confused about what emotion I am feeling" targets an individual's ability to identify their emotions. Participants are asked to choose from five responses ranging from "Strongly disagree" to "Strongly agree". Scores ≥ 61 suggest alexithymia and scores ≤ 51 indicate an individual is non-alexithymic (Taylor, Bagby & Parker, 1997).

Camouflaging Autistic Traits Questionnaire (CAT-Q; α = .94, Hull et al., 2018): This 25-item scale measures camouflaging primarily in autistic people, on a seven-point Likert scale ranging from "Strongly disagree" to "Strongly agree" using statements such as "When I am interacting with someone, I deliberately copy their body language or facial expressions". Scores range from 25 to 175 and higher scores represent higher levels of camouflaging.

Digit span task based on a common test of working memory (DS; α = .92, see Gajewski, Hanisch, Falkenstein, Thönes & Wascher, 2018). This section of the study displayed a single digit every second and participants were instructed to type the numbers in after each set. The test started with groups of three numbers and gradually added a digit, up to nine digits. The digit span task finished when the participant either completed 21 number sequences or answered incorrectly twice in a row. This task was scored using a "partial credit" method (see Conway et al., 2005) where participants receive one point for each selection of numbers recalled correctly in the right order and a proportional score for incorrect answers. For example, a response with four correct digits in an eight-digit trial would receive a score of 0.50 for that trial.

Participants were then shown a debriefing message which gave more information about the study and another chance to contact the researchers.

In Study 1b participants completed the same eight tasks and self-report questionnaires as participants in Study 1a, with minor changes as described.

Demographics and characteristics: The age of diagnosis question was replaced by two questions; 'How old were you when you first suspected you might be on the autism spectrum?' and 'How old were you when you started to identify as autistic?', both of which required responses in text boxes. Location of diagnosis was also changed to ask where participants were born and if different, where they spent their childhood. Gender was changed from a multiple choice to a write in box, following feedback from Study 1a. A text box was added at the end of this section for additional comments or clarification, also in response to feedback from Study 1a.

Statistical Analysis and Power

An a priori analysis using G*Power 3.1.9.7 (Faul, Erdfelder, Buchner & Lang, 2009) indicated that a sample size of 100 provided power of .87 to detect medium sized associations between variables (correlations of ≥.30) using two tailed tests. Data were analysed using Jamovi (The jamovi project, 2021) and SPSS 27 (2020). The seven main predictor variables were computed, and their Cronbach's alpha values were tested. Published scoring procedures were followed for existing scales.

The datasets from Study 1a and Study 1b were combined. This gave a total sample of 201 participants. The age range of the combined dataset was 18 to 72 years (M = 36.63, SD = 13.22) with a gender split of 100 participants identifying as female, 59 as male, 39 as other (including non-binary), and three not disclosing.

A dependent variable was created which represented the age of diagnosis (among the clinically diagnosed participants from Study 1a) and an average of two variables from Study 1b (the age participants began to be suspicious that they might be autistic and the age they began to

identify as autistic). This DV was named 'age of diagnosis or self-diagnosis' (AoD/SD). The mean age of diagnosis/self-diagnosis was 30.03 (*SD* = 14.01) with a range of 3 – 64 years. The time between the reported age of diagnosis/self-diagnosis and current age was calculated and the resulting variable was called 'time elapsed' (TE). The time elapsed since diagnosis/self-diagnosis ranged from 0 to 57 years (*M* = 6.59, *SD* = 9.64).

Five additional independent variables were also created to represent scores for childhood depression, childhood anxiety, childhood sensitivity to the environment, childhood outgoingness and childhood behaviour. Higher scores in all of these variables represented higher levels of the quality described. In the case of childhood behaviour, higher scores represented worse behaviour than lower scores. These five variables are hereinafter referred to as secondary variables as they are comprised of one to three basic questions for which no psychometrics are available.

Incomplete entries were removed, and impossible values were checked for but not found. Data points that fell beyond the interquartile range * 2 from the median were identified as univariate outliers and removed from five of the seven IVs; AQ, RMIE, TAS, CAT-Q and the partially loaded digit span score, as well as from four out of the five secondary IVs (see Appendix C for details). Alternative analysis with outliers can be viewed in Appendix D. Cook's distance identified no bivariate or multivariate outliers.

A series of exploratory analyses were conducted to look at individual differences and group differences. Multiple regression analyses were conducted on the data from 201 respondents to investigate whether the predictor variables; levels of autistic traits, ToM/mentalising ability, depression, anxiety, alexithymia, working memory, camouflaging abilities and childhood traits, could predict a person's age of ASC diagnosis or self-diagnosis or the time elapsed since diagnosis/self-diagnosis. All assumption tests required for multiple regression were undertaken and no violations were found.

A selection of analysis of variance (ANOVA) tests were then conducted to examine group differences between four groups; diagnosed aged 18 or under, diagnosed over 18, self-diagnosed 18 or under and self-diagnosed over 18. Chi-square tests were also conducted to investigate gender relationships between groups. All assumption tests required for ANOVA were undertaken and violations were observed, most importantly in differing group sizes. Levene's test was used to ensure homogeneity of variance and was reported when significant. Additional ANOVAs and chi-squares were conducted to investigate differences between groups of participants diagnosed less than six years ago, diagnosed six or more years ago, self-diagnosed less than six years ago and self-diagnosed six or more years ago.

An alpha level of .05 was used for all statistical tests.

Study 1a & Study 1b Results

Individual Differences

Descriptive statistics for survey measures, including secondary predictors of childhood scores for depression, anxiety, sensitivity to the environment, outgoingness and behaviour, can be viewed in Table 1.

A series of correlation analyses was conducted in order to explore the associations between all 12 independent variables and two dependent variables. These two dependent variables were a) age of diagnosis/self-diagnosis and b) time elapsed since diagnosis/self-diagnosis. In the first set of analyses (see Table 2), all groups were collapsed. In order to establish whether the magnitude of associations between variables differed significantly by diagnostic status (diagnosed or self-diagnosed), correlation analyses were conducted in each group separately. Fisher's Z tests, which were conducted to establish whether associations differed in magnitude between groups, were not significant.

Among the whole sample, AQ was positively correlated with age of diagnosis/self-diagnosis and negatively correlated with time elapsed since diagnosis/self-diagnosis. The former correlation was marginally significant, the latter was significant, and both were weak. Age of diagnosis/self-diagnosis also had small, marginally significant relationships with CAT-Q and a significant correlation with CB, that were all negative. Time elapsed since diagnosis/self-diagnosis was negatively correlated with all of the main IVs and a significantly relationship was observed with all of the main IVs except RMIE and DS. Time elapsed was also positively correlated with CB. The two DVs had a highly significant, moderate negative relationship, $r(201) = -.43$, $p < .001$.

Table 1

Descriptive statistics for Study 1a and Study 1b survey measures

Measure	*N*			*M* (*SD*)			Range		
	Total	DX	SDX	Total	DX	SDX	Total (possible)	DX	SDX
AQ	198	98	100	37.73 (5.33)	38.77 (5.29)	36.71 (5.19)	25-48 (0-50)	25-47	25-48
RMIE	196	97	99	23.67 (5.86)	23.13 (6.43)	24.20 (5.22)	8-34 (0-36)	8-34	9-32
BDI	201	100	101	43.55 (12.33)	42.10 (12.69)	44.99 (11.86)	21-79 (21-84)	21-76	23-79
BAI	201	100	101	44.14 (13.30)	40.68 (12.08)	47.57 (13.62)	21-76 (21-84)	21-71	23-76
TAS	197	98	99	65.12 (10.44)	64.86 (10.81)	65.37 (10.11)	35-91 (20-100)	35-91	42-90
CAT-Q	198	98	100	128.19 (23.73)	122.67 (24.31)	133.60 (21.94)	63-171 (25-175)	63-166	75-171
DS	194	96	98	12.97 (3.74)	12.98 (3.84)	12.97 (3.66)	2.67-20 (0-21)	2.67-20	2.67-19.75
CD	192	95	97	6.30 (2.38)	5.95 (2.18)	6.65 (2.53)	1-10 (0-10)	1-10	1-10
CA	194	96	98	7.48 (2.18)	7.47 (2.05)	7.49 (2.31)	2-10 (0-10)	2-10	2-10
CS	196	98	98	6.59 (2.37)	6.40 (2.37)	6.78 (2.36)	1-10 (0-10)	1-10	1-10
CO	197	99	98	4.00 (1.79)	3.93 (1.82)	4.07 (1.78)	0-9 (0-10)	0-9	0-9
CB	201	100	101	3.50 (2.51)	3.28 (2.46)	3.73 (2.55)	0-10 (0-10)	0-10	0-10

Note. For additional clarity main predictors are shaded in grey. DX: Diagnosed respondents; SDX: Self-diagnosed respondents; AQ: Autism-Spectrum Quotient; RMIE: Reading the Mind in the Eyes task; BDI: Beck Depression Inventory; BAI: Beck Anxiety Inventory; TAS: Toronto Alexithymia Scale; CAT-Q: Camouflaging Autistic Traits Questionnaire; DS: Digit span task; CD: Childhood depression; CA: Childhood anxiety; CS: Childhood sensitivity; CO: Childhood outgoingness; CB: Childhood behaviour.

Table 2

Correlations among predictor variables

	AoD/SD	TE	AQ	RMIE	BDI	BAI	TAS	CAT-Q	DS	CD	CA	CS	CO
TE	-.43**	-											
AQ	.12m	-.15*	-										
RMIE	.04	-.08	-.34**	-									
BDI	-.05	-.20**	.08	-.04	-								
BAI	-.12	-.17*	.03	-.02	.69**	-							
TAS	.07	-.19**	.36**	-.23**	.30**	.21**	-						
CAT-Q	-.13m	-.24**	.06	.02	.19**	.36**	.06	-					
DS	.09	-.02	.02	.07	-.05	-.01	-.06	-.05	-				
CD	.08	-.08	-.01	.02	.40**	.36**	.10	.19**	.02	-			
CA	-.08	.00	.03	-.14m	.24**	.41**	.04	.24**	-.00	.46**	-		
CS	-.11	.05	.21**	-.25**	.14m	.27**	.17*	.14m	-.01	.27**	.38**	-	
CO	-.09	.00	-.10	.10	-.06	-.05	-.13	-.06	-.06	-.03	-.19*	.02	-
CB	-.15	.13m	-.01	-.08	.06	.16*	.14	-.04	.01	.02	.04	.15*	.39**

Note. m: $p < .10$, * $p < .05$, ** $p < .01$. AoD/SD: Age of diagnosis/self-diagnosis; TE: Time elapsed since diagnosis/self-diagnosis; AQ: Autism-Spectrum Quotient; RMIE: Reading the Mind in the Eyes task; BDI: Beck Depression Inventory; BAI: Beck Anxiety Inventory; TAS: Toronto Alexithymia Scale; CAT-Q: Camouflaging Autistic Traits Questionnaire; DS: Digit span task; CD: Childhood depression; CA: Childhood anxiety; CS: Childhood sensitivity; CO: Childhood outgoingness; CB: Childhood behaviour.

Age of Diagnosis/Self-Diagnosis

In this first set of analyses, the aim was to address whether individual differences in autistic traits, mindreading/theory of mind, depression, anxiety, alexithymia, camouflaging autistic traits, and/or digit span score predict individual differences in age of diagnosis/self-diagnosis of autism.

All seven main predictors were entered simultaneously in multiple regression, with age of diagnosis/self-diagnosis as the dependent variable. This resulted in a non-significant model, $F(7,181) = 1.55$, $p = .154$.

A hierarchical regression was conducted to establish whether accounting for levels of childhood traits improved the model. The first step included childhood depression, childhood anxiety, childhood sensitivity, childhood outgoingness and childhood behaviour. This model explained 5.7% of the variance in age of diagnosis/self-diagnosis, and was marginally significant, $F(5, 180) = 2.20$, $p = .057$. The second step added the seven main predictor variables (autism-spectrum quotient scores, reading the mind in the eyes scores, Beck depression inventory scores, Beck anxiety inventory scores, Toronto alexithymia scale scores, camouflaging autistic traits questionnaire scores and digit span scores). This model explained an additional 5.6% of the variance in age of diagnosis/self-diagnosis, which was a non-significant increase, $F(7, 173) = 1.55$, $p = .153$. This final model was significant, $F(12,173) = 1.84$, $p = .045$, and explained 11.3% of the variance in age of diagnosis/self-diagnosis (see Table 3). Specifically, higher levels of childhood depression ($\beta = 0.21$, $p = .018$) significantly and autism-spectrum quotient scores ($\beta = 0.15$, $p = .073$) marginally significantly predicted higher age of diagnosis/self-diagnosis. No other variables were significant.

Table 3

Hierarchical regression results with age of diagnosis/self-diagnosis as dependent variable.

Predictor	*B*	B CI		*SE B*	β	*p*
		LL	UL			
Step one						
CD	0.98	0.03	1.94	0.48	0.17	.043
CA	-0.85	-1.96	0.27	0.56	-0.13	.131
CS	-0.54	-1.47	0.40	0.47	-0.09	.258
CO	-0.59	-1.80	0.62	0.61	-0.08	.339
CB	-0.60	-1.46	0.25	0.43	-0.11	.165
Step two						
CD	1.22	0.21	2.24	0.51	0.21	.018
CA	-0.48	-1.64	0.68	0.59	-0.07	.417
CS	-0.68	-1.64	0.29	0.49	-0.11	.171
CO	-0.40	-1.63	0.84	0.62	-0.05	.527
CB	-0.65	-1.53	0.24	0.45	-0.12	.150
AQ	0.39	-0.04	0.84	0.22	0.15	.073
RMIE	0.14	-0.24	0.52	0.19	0.06	.471
BDI	-0.10	-0.34	0.15	0.12	-0.09	.432
BAI	-0.03	-0.27	0.20	0.12	-0.03	.779
TAS	0.11	-0.11	0.33	0.11	0.08	.320
CAT-Q	-0.07	-0.16	0.02	0.05	-0.12	.120
DS	0.24	-0.30	0.78	0.27	0.06	.379

Note. CD: Childhood depression; CA: Childhood anxiety; CS: Childhood sensitivity; CO: Childhood outgoingness; CB: Childhood behaviour; AQ: Autism-Spectrum Quotient; RMIE: Reading the Mind in the Eyes task; BDI: Beck Depression Inventory; BAI: Beck Anxiety Inventory; TAS: Toronto Alexithymia Scale; CAT-Q: Camouflaging Autistic Traits Questionnaire; DS: Digit span task.

Time Elapsed Since Diagnosis/Self-Diagnosis

In the next set of analyses, the aim was to address whether individual differences in autistic traits, theory of mind, depression, anxiety, alexithymia, camouflaging autistic traits, digit span score and/or childhood traits predict individual differences in the time elapsed since diagnosis/self-diagnosis (TE; $M = 6.61$, $SD = 9.75$, $N = 201$).

All 12 predictors were entered into a hierarchical regression, with time elapsed as the DV. Step one, consisting of the five childhood trait scores, created a non-significant model, $F(5,180) = 1.08$, $p = .372$. The seven main variables were added into step two, and this resulted in a significant increase, $F(7,173) = 4.17$, $p < .001$. The final model was significant, $F(12,173) = 2.94$, $p = .001$, and explained 16.9% of the variance in time elapsed since diagnosis/self-diagnosis (Table 4). Bad behaviour as a child predicted a longer time since diagnosis (β = 0.17, $p = .031$),

whilst higher TAS scores (β = -0.17, *p* = .036) and higher CAT-Q scores (β = -0.20, *p* = .009) both predicted lower time elapsed since diagnosis/self-diagnosis.

Table 4

Hierarchical regression results with time elapsed since diagnosis/self-diagnosis as dependent variable.

Predictor	*B*	B CI		*SE B*	β	*p*
		LL	UL			
Step one						
CD	-0.43	-1.10	0.25	0.34	-0.10	.215
CA	0.08	-0.70	0.86	0.40	0.02	.838
CS	0.20	-0.46	0.86	0.33	0.05	.551
CO	-0.24	-1.10	0.61	0.43	-0.45	.575
CB	0.55	-0.06	1.15	0.31	0.14	.075
Step two						
CD	-0.40	-0.72	0.64	0.35	-0.01	.908
CA	0.15	-0.63	0.93	0.40	0.03	.701
CS	0.41	-0.25	1.06	0.33	0.10	.220
CO	-0.54	-1.37	0.29	0.42	-0.10	.204
CB	0.65	0.06	1.25	0.30	0.17	.031
AQ	-0.25	-0.53	0.04	0.15	-0.13	.093
RMIE	-0.19	-0.44	0.07	0.13	-0.11	.146
BDI	-0.08	-0.24	0.09	0.08	-0.10	.347
BAI	-0.04	-0.20	0.12	0.08	-0.06	.586
TAS	-0.16	-0.31	-0.10	0.08	-0.17	.036
CAT-Q	-0.08	-0.14	-0.02	0.03	-0.20	.009
DS	-0.12	-0.48	0.24	0.18	-0.05	.503

Note. CD: Childhood depression; CA: Childhood anxiety; CS: Childhood sensitivity; CO: Childhood outgoingness; CB: Childhood behaviour; AQ: Autism-Spectrum Quotient; RMIE: Reading the Mind in the Eyes task; BDI: Beck Depression Inventory; BAI: Beck Anxiety Inventory; TAS: Toronto Alexithymia Scale; CAT-Q: Camouflaging Autistic Traits Questionnaire; DS: Digit span task.

See Appendix E for supplementary findings.

Group Differences

Age of Diagnosis/Self-Diagnosis

In this next set of analyses, the aim was to address whether differences exist between groups (diagnosed 18 or under, diagnosed over 18, self-diagnosed 18 or under and self-diagnosed over 18) in each of the measures. A 4 (Group) x 4 (Gender) Chi-square analysis was significant, $\chi 2 = 20.98$, $p = .013$. Post hoc comparisons of gender by group membership revealed significantly more people in the self-diagnosed aged 18 or under category identified their gender as "Other" than expected, $p = .002$. No other associations were significant after Bonferroni adjustment, $p = .003$.

A one-way MANOVA was conducted on AQ, RMIE, BDI, BAI, TAS, CAT-Q, DS, CD, CA, CS, CO and CB scores with diagnostic status and age of diagnosis/self-diagnosis group as independent variable. This variable consisted of four groups, diagnosed aged 18 or younger, diagnosed over 18 years of age, self-diagnosed aged 18 or younger and self-diagnosed over 18 (see Table 5 for details). There was a marginally significant difference in task performance based on a participant's age of diagnosis and diagnostic status, F (36, 441) = 1.42, $p = .058$; Wilk's $\Lambda = 0.723$, $\eta_p^2 = .10$. The results are summarised in Table 6. Follow up ANOVAs were then conducted on AQ, BAI, CAT-Q and DS scores. Contrasts were run to test differences between the diagnosed and the self-diagnosed and between those diagnosed/self-diagnosed aged 18 or under and those diagnosed over 18 in AQ, BAI, CAT-Q and DS scores. All contrasts were run separately, therefore no Bonferroni correction was necessary. Data is presented as mean ± standard deviation.

Table 5

Descriptive statistics for age of diagnosis/self-diagnosis ANOVA groups

ANOVA group	*N*	Mean age of diagnosis/self-diagnosis (*SD*)	Mean age (*SD*)
1. Diagnosed aged 18 or younger	29	10.62 (5.67)	27.62 (12.62)
2. Diagnosed over 18	71	38.45 (11.97)	41.41 (12.28)
3. Self-diagnosed aged 18 or younger	11	15.14 (3.73)	27.91 (13.41)
4. Self-diagnosed over 18	90	31.66 (10.38)	36.82 (12.23)

Note. *N*: Number; *SD*: Standard deviation; ages measured in years.

Table 6

MANOVA results with age of diagnosis/self-diagnosis as fixed factor and contrasts

Variable	*F*	*p*	η_p^2	Contrasts	Cohen's *d* for contrasts
AQ	3.66	.014	.06	Dx over 18 > self-dx over 18	0.54
				DX = SDX	
				18 or under = over 18	
RMIE	0.36	.786	.01		
BDI	0.45	.719	.01		
BAI	4.05	.008	.07	Dx over 18 < self-dx over 18	0.52
				Dx 18 or under < self-dx over 18	0.50
				DX < SDX	0.60
				18 or under = over 18	
TAS	1.47	.225	.03		
CAT-Q	2.60	.054	.05	Dx over 18 < self-dx over 18	0.46
				Dx 18 or under < self-dx over 18	0.51
				DX < SDX	0.47
				18 or under = over 18	
DS	2.47	.064	.04	18 or under < over 18	0.62
				Dx 18 or under < dx over 18	0.67
				DX = SDX	
CD	0.50	.682	.01		
CA	0.35	.790	.01		
CS	0.75	.523	.01		
CO	0.94	.424	.02		
CB	1.16	.326	.02		

Note. AQ: Autism-Spectrum Quotient; RMIE: Reading the Mind in the Eyes task; BDI: Beck Depression Inventory; BAI: Beck Anxiety Inventory; TAS: Toronto Alexithymia Scale; CAT-Q: Camouflaging Autistic Traits Questionnaire; DS: Digit span task; CD: Childhood depression; CA: Childhood anxiety; CS: Childhood sensitivity; CO: Childhood outgoingness; CB: Childhood behaviour.

A one-way ANOVA was conducted to determine if AQ scores were different for groups with different diagnostic status (clinically diagnosed/self-diagnosed) and age of diagnosis/self-diagnosis. AQ score was significantly different between different groups, $F(3, 194) = 3.67$, $p = .013$, $\eta_p^2 = 0.05$. AQ score increased from the self-diagnosed over 18 ($M = 36.65$, $SD = 5.24$) to the self-diagnosed 18 or under ($M = 37.19$, $SD = 4.99$), diagnosed 18 or under ($M = 37.27$, $SD = 5.96$) and diagnosed over 18 ($M = 39.37$, $SD = 4.91$) groups, in that order. Tukey post hoc analysis revealed that the mean difference between those that were diagnosed over 18 and those that were self-diagnosed over 18 (2.72, 95% CI [1.07, 4.36]) was statistically significant ($p = .001$). No other group differences were statistically significant.

A one-way ANOVA found that the effect of group membership on BAI scores was significant, $F(3,197) = 4.93$, $p = .003$, $\eta_p^2 = 0.07$. BAI mean scores ranged from the diagnosed over 18 ($M = 40.62$, $SD = 12.11$) to the diagnosed aged 18 or younger ($M = 40.81$, $SD = 12.20$), the self-diagnosed over 18 ($M = 47.26$, $SD = 13.54$) and self-diagnosed 18 or under ($M = 50.09$, $SD = 14.73$). Post hoc analysis identified two significant differences, with those who self-diagnosed over 18 having significantly higher BAI scores than those who were diagnosed aged over 18 (-6.64, 95% CI [-10.69, -2.60], $p = .001$) and those who were diagnosed 18 or under (-6.45, 95% CI [-11.89, -1.01], $p = .020$). A contrast confirmed that the diagnosed had lower BAI scores than the self-diagnosed overall, -15.92, 95% CI [-25.81, -6.03], $p = .002$.

Group membership, tested with a one-way ANOVA, was also found to have a significant effect on CAT-Q scores, $F(3,194) = 3.67$, $p = .013$, $\eta_p^2 = .05$. CAT-Q score increased from the diagnosed age 18 or younger ($M = 121.77$, $SD = 24.83$) to the diagnosed over 18 ($M = 123.03$, $SD = 24.27$), the self-diagnosed 18 or under ($M = 133.27$, $SD = 23.05$) and the self-diagnosed over 18 ($M = 133.64$, $SD = 21.93$). Post hoc tests showed the same pattern as BAI scores, with the diagnosed participants reporting lower camouflaging than the self-diagnosed over 18s, regardless of whether they were diagnosed at 18 or younger, (11.87, $p = .019$, 95% CI [1.93, 21.81]) or over

the age of 18, (10.61, p = .005, 95% CI [3.28, 17.94]). Contrasts found that the self-diagnosed reported higher CAT-Q scores than the diagnosed, (22.12, p = .016, 95% CI [-40.01, -4.22]), but no significant difference between those diagnosed or self-diagnosed aged 18 or under and those diagnosed or self-diagnosed over 18 (p = .858).

A Welch one way ANOVA was conducted[2] to investigate the effect of group membership on DS scores, $F(3,190) = 2.68$, p = .049, η_p^2 = .04. Games-Howell post hoc analysis found a statistically significant difference in DS score between the diagnosed over 18 group (M = 13.64, SD = 3.90) and the diagnosed 18 or under group (M = 11.27, SD = 3.14), a mean difference of 2.37 (SE =0 .76), p = .003. Contrasts identified a significant difference between those who were diagnosed or self-diagnosed at 18 or younger (M = 24.31, SD = 5.43) and those that were over 18 at the time of diagnosis or self-diagnosis (M = 26.59, SD = 7.71), with a difference of -2.29 (SE = 1.11), p = .044. No other significant differences were identified, including between the diagnosed at any age and the self-diagnosed at any age groups (p = .335).

Time Elapsed Since Diagnosis/Self-Diagnosis

This final set of analyses aimed to address whether differences exist between four groups of participants (diagnosed less than six years before completing the survey, diagnosed six or more years before completing the survey, self-diagnosed less than six years before completing the survey and self-diagnosed six or more years before completing the survey) in each of the measures (see Table 7 for details). A Chi-square analysis found significant association between group membership and gender, $\chi 2 = 26.04$, p = .002. Post hoc comparisons of gender by group membership revealed that significantly more people in the self-diagnosed less than six years category identified their gender as “Other” than expected, $\chi 2 = 12.82$, p = .0003. The self-diagnosed less than six years ago group also contained significantly fewer men than expected,

[2] Levene’s test of Homogeneity of Variance, p = .026

$\chi 2 = 14.00$, $p < .0001$. No other associations were significant after Bonferroni adjustment, $p = .003$.

Table 7

Descriptive statistics for time elapsed since diagnosis/self-diagnosis ANOVA groups

ANOVA group	*N*	Mean time elapsed since diagnosis/self-diagnosis (*SD*)	Mean age (*SD*)
1. Diagnosed less than 6 years ago	71	2.06 (1.72)	37.85 (12.89)
2. Diagnosed 6 or more years ago	29	19.21 (14.73)	36.34 (16.09)
3. Self-diagnosed less than 6 years ago	64	2.06 (1.52)	32.25 (11.05)
4. Self-diagnosed 6 or more years ago	37	13.35 (9.86)	42.08 (12.82)

Note. *N*: Number; *SD*: Standard deviation; ages measured in years.

A one-way MANOVA was conducted on AQ, RMIE, BDI, BAI, TAS, CAT-Q, DS, CD, CA, CS, CO and CB scores with diagnostic status and time elapsed since diagnosing/self-diagnosing and survey participation as independent variable. This variable consisted of four groups, diagnosed less than six years ago ($N = 61$), diagnosed six or more years ago ($N = 20$), self-diagnosed less than six years ago ($N = 53$) and self-diagnosed six or more years ago ($N = 30$). The results of the MANOVA are summarised in Table 8.

There was a statistically significant difference in task performance based on the time elapsed since diagnosis/self-diagnosis and a participant's diagnostic status , $F (36, 441) = 1.80$, $p = .004$; Wilk's $\Lambda = 0.667$, $\eta_p^2 = .13$. Follow up ANOVAs were then conducted on AQ, BDI, BAI, CAT-Q and CB scores. Contrasts were run to test differences between the diagnosed and the self-diagnosed and between those diagnosed/self-diagnosed less than six years ago and those diagnosed/self-diagnosed six or more years ago in AQ, BDI, BAI, CAT-Q and CB scores. Data is presented as mean ± standard deviation.

Table 8

MANOVA results with time elapsed since diagnosis/self-diagnosis as fixed factor and contrasts.

Variable	*F*	*p*	η_p^2	Contrasts	Cohen's *d* for contrasts
AQ	2.74	.045	.05	DX recently > SDX recently	0.57
				DX > SDX	0.30
				DX/SDX recently = DX/SDX longer ago	
RMIE	1.27	.285	.02		
BDI	2.69	.048	.05	DX recently > DX longer ago	0.51
				DX longer ago < SDX recently	0.79
				SDX recently > SDX longer ago	0.52
				DX < SDX	0.29
				DX/SDX recently > DX/SDX longer ago	0.52
BAI	8.47	.000	.14	DX recently < SDX recently	0.67
				DX longer ago < SDX recently	1.01
				SDX recently > SDX longer ago	0.64
				DX < SDX	0.54
				DX/SDX recently > DX/SDX longer ago	0.48
TAS	0.25	.864	.01		
CAT-Q	6.61	.000	.11	DX recently < SDX recently	0.61
				DX longer ago < SDX recently	1.26
				SDX recently > SDX longer ago	0.74
				DX < SDX	0.50
				DX/SDX recently > DX/SDX longer ago	0.60
DS	0.02	.997	.00		
CD	0.63	.598	.01		
CA	0.29	.833	.01		
CS	1.21	.307	.02		
CO	0.80	.493	.02		
CB	2.43	.067	.04	DX = SDX	
				DX/SDX recently < DX/SDX longer ago	0.41
				DX recently < DX longer ago	0.54
				DX recently < SDX longer ago	0.54

Note. AQ: Autism-Spectrum Quotient; RMIE: Reading the Mind in the Eyes task; BDI: Beck Depression Inventory; BAI: Beck Anxiety Inventory; TAS: Toronto Alexithymia Scale; CAT-Q: Camouflaging Autistic Traits Questionnaire; DS: Digit span task; CD: Childhood depression; CA: Childhood anxiety; CS: Childhood sensitivity; CO: Childhood outgoingness; CB: Childhood behaviour.

A one-way ANOVA was conducted to determine if AQ scores were different for groups with different diagnostic status and recency of diagnosis/self-diagnosis. AQ score was statistically significantly different between different groups, $F(3, 194) = 3.43$, $p = .018$, $\eta_p^2 = 0.05$. AQ score increased from the self-diagnosed less than six years ago ($M = 36.36$, $SD = 4.97$) to the self-diagnosed six or more years ago ($M = 37.31$, $SD = 5.57$), diagnosed more than six years ago ($M = 37.63$, $SD = 5.90$) and diagnosed less than six years ago ($M = 39.22$, $SD = 5.00$) groups.

Tukey post hoc analysis revealed that the mean difference between those that were diagnosed less than six years ago and those that were self-diagnosed less than six years ago (2.87, 95% CI [-4.66, -1.08]) was statistically significant (p = .002). A contrast found that the diagnosed had significantly higher AQ scores than the self-diagnosed (3.19, p = .047, 95% CI [-6.33, -0.04]). No other group differences were statistically significant.

A one-way ANOVA found that the effect of group membership on BDI scores was significant, $F(3,197) = 4.70$, p = .003, $\eta_p^2 = 0.07$. Post hoc analysis identified three significant differences. The diagnosed six or more years ago group, (M = 37.69, SD = 11.74) had significantly lower BDI scores than those who were diagnosed less than six years ago group (M = 43.90, SD = 12.69; 6.21, p = .020, 95% CI [-11.43, -0.99]) as well as those self-diagnosed less than six years ago (M = 47.15, SD = 12.35; 9.47, p = .001, 95% CI [-14.76, -4.17]). The BDI scores for the self-diagnosed less than six years ago group were also significantly higher than the self-diagnosed six or more years ago group (M = 41.25, SD = 10.07; 5.90, p = .018, 95% CI [-10.79, -1.02]). Contrasts revealed that the diagnosed had marginally significantly lower BDI scores than the self-diagnosed, 6.82, p = .062, 95% CI [8.33, 13.97] and those diagnosed or self-diagnosed more recently had significantly higher BDI scores than those diagnosed or self-diagnosed six or more years ago, (12.11, p = .001, 95% CI [-19.26, -4.97]).

A one-way ANOVA was conducted to determine if BAI scores were different for groups with different diagnostic status and recency of diagnosis/self-diagnosis. BAI score was statistically significantly different between different groups, $F(3, 197) = 8.92$, p <.001, $\eta_p^2 = 0.12$. BAI score followed a similar pattern to BDI scores, with the self-diagnosed less than six years ago group (M = 50.57, SD = 13.75) being significantly higher than the three other groups. In order of greatest to smallest mean differences, the self-diagnosed recently had higher BAI scores than the diagnosed six or more years ago group (M = 38.12, SD = 10.86; 12.45, p <.0005, 95% CI [-18.00, -6.90]), the diagnosed less than six years ago group (M = 41.72, SD = 12.46; 8.85, p

<.001, 95% CI [-13.13, -4.58]) and the self-diagnosed six or more years ago group (*M* = 42.38, *SD* = 11.87; 8.20, *p* = .002, 95% CI [-13.32, -3.07]). Contrasts revealed significant mean differences between the diagnosed and the self-diagnosed with the latter scoring higher in the BAI (13.11, *p* = .001, 95% CI [-20.60, -5.62]) and between those diagnosed or self-diagnosed less than six years ago and those diagnosed or self-diagnosed longer ago, with the former scoring higher, (11.79, *p* = .002, 95% CI [4.30, 19.28]).

A Welch one way ANOVA[3] was conducted to investigate the effect of group membership on CAT-Q scores, $F(3,194) = 9.34$, $p < .001$, $\eta_p^2 = .13$. Games-Howell post hoc analysis found three statistically significant differences between groups in CAT-Q score, with the opposite of the pattern found in the BDI and BAI scores. Those who self-diagnosed less than six years ago (*M* = 139.32, *SD* = 18.49) had significantly higher CAT-Q scores than all other groups. The diagnosed less than six years ago group (*M* = 125.71, *SD* = 25.31) had a mean difference of 13.60 (*SE* = 3.81, *p* = .003), those that had been diagnosed six or more years ago (*M* = 115.05, *SD* = 20.05) scored an average of 24.26 (*SE* = 4.44, *p* <.001) less than the recently self-diagnosed and the self-diagnosed six or more years ago group (*M* = 123.44, *SD* = 24.08) had a mean difference of 15.88 (*SE* = 4.63, *p* = .006). Contrasts identified a significant difference between those who were diagnosed or self-diagnosed less than 6 years ago and those that diagnosed or self-diagnosed six or more years ago, with a difference of 26.54 (*SE* = 6.71), *p* <.001. The difference in CAT-Q scores between the diagnosed and the self-diagnosed was also significant, 21.99, *p* = .001, *SE* = 6.71.

Group membership, tested with a one-way ANOVA, was also found to have a significant effect on CB scores, $F(3,197) = 3.21$, $p = .024$, $\eta_p^2 = .05$. CB score increased from the diagnosed less than six years ago (*M* = 2.89, *SD* = 2.35) to the self-diagnosed less than six years ago (*M* = 3.46, *SD* = 2.57), the self-diagnosed six or more years ago (*M* = 4.19, *SD* = 2.48) and the diagnosed six

[3] due to significant Levene's test of Homogeneity, *p* = .049

or more years ago (*M* = 4.22, *SD* = 2.56). Post hoc tests revealed marginally significant differences between the diagnosed less than six years ago group and the self-diagnosed six or more years ago group (1.30, *p* = .011, 95% CI [-2.29, -0.31]) and the diagnosed six or more years ago group (1.33, *p* = .016, 95% CI [-2.41, -0.26]). Contrasts found the difference between those diagnosed or self-diagnosed less than six years ago and those diagnosed or self-diagnosed longer ago, significant, 2.05 (*p* = .007, 95% CI [-3.53, -0.58]). The difference in CB scores between the diagnosed and the self-diagnosed was not significant, *p* = .473.

Study 1a & Study 1b Discussion

The current study examined the relationships among seven main measures and five secondary variables and the age a person was either officially diagnosed or self-diagnosed as autistic. It also looked at the period of time elapsed between diagnosis/self-diagnosis and completing the survey. These seven main predictors were autistic traits, theory of mind, depression, anxiety, alexithymia, camouflaging, working memory. Autistic traits were found to be higher in those that were diagnosed over 18 than those who self-diagnosed over the age of 18, in line with one of the study hypotheses. The self-diagnosed generally reported higher levels of camouflaging and anxiety than the diagnosed, regardless of age of diagnosis or time elapsed since diagnosis/self-diagnosis. The only significant finding with regards to differences between those over 18 (diagnosed or self-diagnosed) and those aged 18 or under (diagnosed or self-diagnosed), was that those diagnosed/self-diagnosed over 18 scored higher in a test of working memory. Levels of depression, alexithymia, childhood depression and childhood behaviour also played significant roles in the results, which will be discussed.

Whilst both hierarchical regressions were significant, they only explained small amounts of variance; 11.3% variance in age of diagnosis/self-diagnosis and 16.9% in time elapsed since diagnosis/self-diagnosis. This means that although the 12 variables explored in this study have some relevance, there are other variables at play. These could include stigma, either real or perceived, surrounding autism and autistic people causing people to not want to come ‘out’ as autistic, socioeconomic status preventing people from being able to afford access to diagnosticians for example, parental education etc… Without further time and resources it is not possible for this study to look into every possible factor that could lead to a late or lack of diagnosis.

The finding that in this study’s sample, higher autistic traits resulted in later diagnosis, is counter intuitive. Taken in a theoretical sense, this implies that those with fewer autistic traits

are diagnosed earlier, which evidence suggests is not the case (Ouellette-Kuntz et al., 2009). However, if the relationship is viewed from a practical viewpoint, the AQ is widely available online and many autistic people have taken it several times during the course of diagnosis. With the traits of autism being easily researched, it would not be hard to influence the score to make you seem more autistic. Furthermore, although described as a screening tool for adults and adolescents, the AQ does not allow for changes over time. Some of these changes might be a natural element of aging while others might be specific to a person's experience of autism or mediated by camouflaging for example. Future examination of the relationship between autistic traits and age of diagnosis/self-diagnosis and/or time elapsed since diagnosis/self-diagnosis should consider utilising less well-known measures in an attempt to avoid any bias involved in having prior knowledge of the questions.

The finding that childhood behaviour could be a factor in diagnosis is also counter intuitive, given evidence that behavioural differences are often what brings a child to the attention of caregivers or teachers (Zwaigenbaum et al., 2019). It could suggest that bad behaviour alongside masking and/or high autistic traits can lead to misdiagnosis or even simply disguise the need for diagnosis as the child is labelled as naughty. It is hard to describe one's entire childhood on a scale of 1 to 10, or at all the older one gets; therefore, it is possible that this measure was not ideal for a survey in which age plays a large role. All five of the childhood measures were developed specifically for this study and were not piloted. To this researcher's knowledge no current scale exists to measure a participants historic childhood behaviour quantitatively[4]. It would be interesting to investigate this relationship qualitatively and compare the data with parent reports of a person's childhood behaviour.

[4] Whilst measures exist for caregivers to quantify a current child's behaviour, such as the Child Behaviour Checklist, the necessary work required to adjust the questions for a sample of autistic adults to describe their own past behaviour would be beyond the scope of this project.

As a very specific behaviour, camouflaging appears to play an important role for both diagnosed and self-diagnosed autistic people. Although correlated marginally with age of diagnosis/self-diagnosis and significantly with time elapsed since diagnosis/self-diagnosis, camouflaging scores were only significant in regression analysis with the latter. This negative relationship suggests that people camouflage less the longer they have identified as an autistic person, whether officially diagnosed or not. The results of the second set of ANOVAs and post hoc tests support this finding, with the self-diagnosed recently group having the highest group mean among the four groups. These follow up tests also found that the self-diagnosed reported higher levels of camouflaging than the diagnosed. This is an unexpected, yet well supported, finding, as the self-diagnosed participants in this study reported significantly lower levels of autistic traits than the diagnosed participants. Whilst the CAT-Q claims to measure autistic traits, it is not exclusively for autistic people that have diagnoses. As there is no way to tell if the self-diagnosed participants in this study are actually autistic or not, further investigation would be useful in analysing this finding.

Although theorised to play a big role in the age of autism diagnosis, theory of mind was not found to predict any of the key outcome variables or distinguish between groups in the current study. In contrast, the other cognitive measure, the digit span task, appeared to be somewhat linked to age of diagnosis. The finding that those participants who were diagnosed aged 18 or younger scored lower on the digit span task than their counterparts who were diagnosed over 18, suggests that working memory could play a role in autistic people going undiagnosed until later in life. It could be theorised that by utilising traits associated with better working memory, such as problem-solving skills and the ability to focus on tasks, these later diagnosed autistic people have not needed to question their neurology. The digit span task used in this study was an effective, yet basic, shortened version of those used in much more extensive testing batteries. As these full tests are beyond the scope of this current research, it is

suggested that future research explores this finding as the next logical step in age of autism diagnosis research.

As in previous research strong relationships were observed between a number of variables, most notably between the Beck depression and anxiety inventories and a well-established negative correlation between the RMIE and the AQ. The secondary, childhood variables shared some strong correlations, especially the childhood depression and childhood anxiety scores, which shared significance with their more official adult counterpart measures, the Beck inventories. No previous information was found regarding a possible relationship between alexithymia and camouflaging autistic traits. This is likely to be because the concept of camouflaging is a relatively new one and a tool for measuring levels of camouflaging, the CAT-Q was only published in 2018.The current study found no significant relationship between the two variables.

The results of this study echo the general trend of Corden, Brewer and Cage's (2021) paper, with weaker relationships between the independent variables and age of diagnosis than between the independent variables and time elapsed since diagnosis. There was also a possible period of post diagnostic transition observed in the current study. Corden and colleagues based their idea of a post diagnostic transition period on their qualitative data, whereas the current study found quantitative evidence of differences between those diagnosed or self-diagnosed either side of six years in five measures. The majority of these significant differences involve measures of depression and anxiety, as well as camouflaging which has been linked to depression and anxiety (Hull et al., 2017). The general trend was that those who either choose an autistic identity by self-diagnosing or had confirmation of their autistic identity within the last six years reported more depression, anxiety and camouflaging. This supports previous studies, including identity studies such as Frank (1993), which discusses the idea of reconstructing self-identity after a life changing diagnosis. As well as providing

further evidence of the relevance of the time elapsed variable, this study advises further research into the exact time period. Knowledge of how a person adjusts after diagnosis could help development of more bespoke post diagnosis services.

As much as any exploratory research can have limitations, one can be levied at this study. As the survey was open to adults in any country, national diagnostic practices cannot be considered. A great deal of existing literature (e.g. Baron-Cohen et al., 2009; Brett et al., 2016) studies participants from certain countries, in part because someone who meets the clinical diagnostic criteria for an ASC in the UK might not meet Brazilian standards for diagnosis, for example. Possible language barriers could also skew results as it could be posited that participants from countries where English is not the main language might answer questions differently to native English speakers. This needs to be addressed in any future study.

Studies 1a and 1b cast a wide net to explore as many possibilities as possible in an area that is lacking in quantitative research. Study 2 therefore sought to conceptually replicate certain elements of the previous study's findings, namely (1a) that the measures will explain more variance in the time elapsed since diagnosis/self-diagnosis than the age of diagnosis/self-diagnosis, (1b) with lower autistic traits predicting the former and higher autistic traits predicting the latter, (2) the diagnosed will report higher levels of autistic traits and lower levels of depression, anxiety and camouflaging than the self-diagnosed and (3) those that received diagnoses or self-diagnosed less than six years ago will report higher levels of depression, anxiety and camouflaging than those diagnosed/self-diagnosed longer ago. Study 2 also aims to address certain issues from Studies 1a and 1b with slightly different measures, such as the abridged Ritvo Autism and Asperger Diagnostic Scale instead of the AQ, and participant characteristics, such as recruiting a sample of participants from the UK, as opposed to an international sample.

Study 2 Method

The method for Study 2 was the same as Studies 1a and 1b unless otherwise specified.

Participants

Study 2 participants were aged 18 or over, diagnosed or self-diagnosed as autistic and from the UK. Two hundred and sixty-nine participants responded to the link and 208 completed at least one measure. All participants chose to disclose their gender, with 149 (71.6%) identifying as Female, 36 (17.3%) as Male and 23 (11.1%) as Other. 65.4% (*n* = 136) claimed to have a full diagnosis of an ASC and out of the 72 participants who did not have an official diagnosis, 38 had sought an ASC diagnosis. The age range was 18 – 67 years, with a mean average age of 35.39 (*SD* = 11.26). The range of age of diagnosis was 1 – 62[5] years old, with a mean age of diagnosis of 30.04 *(SD* = 13.30). The time elapsed since diagnosis/self-diagnosis ranged from 0 to 34 years, *M* = 5.38, *SD* = 6.75.

Procedure

The survey stayed live for two months and took an average of 18 minutes to complete.

Materials

Participants completed five self-report questionnaires in the order described.

Demographics and Characteristics: The following information was gathered for each participant; age of ASC diagnosis and current age were recorded, as well as details about the respondent's diagnosis, namely the location and specific diagnosis as an alternative to asking

[5] One participant cited their age of diagnosis as one year old. Although younger than the generally accepted minimum age of diagnosis (three years old), this participant mentioned the original diagnosis was confirmed at age five. Therefore, the lead researcher took the original diagnosis age as age of diagnosis and for the time elapsed since diagnosis variable.

for proof of diagnosis. Gender was also recorded giving four options of Female, Male, Other and Prefer not to say, with the option to elaborate on the choice of Other.

RAADS-14 (Eriksson, Andersen & Bejerot, 2013; based on the Ritvo Autism Asperger Diagnostic Scale-Revised (RAADS-R), Ritvo et al., 2011): The RAADS-14 is a shortened version of the RAADS-R, a scale to gauge the level of autistic traits an adult possesses. When used alongside the Autism-Spectrum Quotient (AQ), the RAADS-14 had a sensitivity of 0.52 and a specificity of 0.73, compared to the AQ's sensitivity of 0.45 and a specificity of 0.52. Each of the RAADS-14's 14 items has four possible responses; True now and when I was young, True only now, True only when I was younger than 16 and Never true. Higher scores indicate higher levels of autistic traits, and scores range from 0 to 42. The clinical cut off score is 14. The internal consistency in this sample was $\alpha = .76$.

Beck Anxiety Inventory (BAI; $\alpha = .92$, Beck & Steer, 1993)

Toronto Alexithymia Scale (TAS; $\alpha = .81$, Bagby, Parker & Taylor, 1994)

Beck Depression Inventory (BDI-II; $\alpha = .92$, Beck, Brown & Steer, 1996)

Camouflaging Autistic Traits Questionnaire (CAT-Q; $\alpha = .94$, Hull et al., 2018)

Statistical Analysis and Power

Study 2 aimed to collect data from twice as many participants as Studies 1a and 1b. However, time restraints resulted in ending the survey with 208 responses. G*Power 3.1.9.7 (Faul, Erdfelder, Buchner & Lang, 2009) indicated that a sample size of 208 provided power of .99 to detect medium sized associations between variables (correlations of ≥.30) using two tailed tests.

Impossible values were checked for but not found. Cases with no more than three missing values in the measures had those values replaced with the series mean. Cases with more than three missing values were removed from analysis. Some univariate outliers were identified and

removed from three of the five IVs; RAADS, TAS and CAT-Q score (see Appendix C for details). Cook's distance identified no bivariate or multivariate outliers.

A series of analyses were conducted to look at individual differences and group differences. Multiple regression analyses were conducted on the data from 208 respondents to investigate whether the predictor variables; levels of autistic traits, depression, anxiety, alexithymia, and camouflaging abilities could predict a person's age of ASC diagnosis or self-diagnosis, or the time elapsed since diagnosis/self-diagnosis. All assumption tests required for multiple regression were undertaken and no violations were found.

A selection of analysis of variance (ANOVA) tests were then conducted to examine group differences between four groups; diagnosed aged 18 or under, diagnosed over 18, self-diagnosed 18 or under and self-diagnosed over 18. All assumption tests required for ANOVA were undertaken and violations were observed, firstly in normality. Four out of the seven variables (five IVs and two DVs) had skewed distributions. RAADS, TAS and CAT-Q scores had negative skews between three and four times the standard and TE had a large positive skew. Given the size of the negative skews and the nature of the TE DV, no transformations were made. Levene's test was used to ensure homogeneity of variance and was reported when significant. Fisher method and Tukey correction were used unless otherwise stated.

Additional ANOVAs were conducted to investigate differences between groups of participants diagnosed less than six years ago, diagnosed six or more years ago, self-diagnosed less than six years ago and self-diagnosed six years ago or more. This division of groups was based on the mean of the TE variable and to allow for easier comparison with the previous two studies

An alpha level of .05 was used for all statistical tests, unless otherwise stated.

Study 2 Results

Individual Differences

Descriptive statistics for survey measures can be viewed in Table 9.

Table 9
Descriptive statistics for survey measures

Measure	*N*			*M* (*SD*)			Range		
	Total	DX	SDX	Total	DX	SDX	Total (possible)	DX	SDX
RAADS	199	130	69	34.33 (5.31)	35.28 (4.99)	32.56 (5.49)	17-42 (0- 42)	17-42	20-42
BAI	204	135	69	48.72 (12.99)	49.27 (12.52)	47.64 (13.88)	22-78 (21- 84)	22-76	24-78
TAS	198	132	66*	64.93 (11.46)	65.88 (12.05)	63.03 (10.01)	37-90 (20- 100)	37-90	37-79
BDI	195	130	65*	44.45 (11.14)	44.99 (11.28)	43.38 (10.87)	21-69 (21- 84)	21-69	23-66
CAT-Q	183	122 **	92**	114.96 (19.26)	113.89 (20.17)	117.11 (17.24)	65-150 (25- 175)	65-149	66-150

Note. * More than 5% missing, ** more than 10% missing, DX: Diagnosed respondents; SDX: Self-diagnosed respondents; RAADS: RAADS-14; BAI: Beck Anxiety Inventory; TAS: Toronto Alexithymia Scale; BDI: Beck Depression Inventory; CAT-Q: Camouflaging Autistic Traits Questionnaire.

A series of correlation analyses was conducted in order to explore the associations between all five independent variables and two dependent variables. These two dependent variables were age of diagnosis/self-diagnosis and time elapsed since diagnosis/self-diagnosis. In the first set of analyses (see Table 10), all groups were collapsed. In order to establish whether the magnitude of associations between variables differed significantly by diagnostic status (diagnosed or self-diagnosed), correlation analyses were conducted in each group separately. Fisher's Z tests, which were conducted to establish whether associations differed in magnitude between groups, were not significant.

Among the whole sample, time elapsed since diagnosis/self-diagnosis was negatively correlated with three of the five IVs, RAADS, TAS and CAT-Q. The two DVs had a highly

significant, moderate negative relationship, $r(208) = -.53$, $p < .001$. Age of diagnosis/self-diagnosis was not significantly correlated with any IV.

Table 10
Correlations among predictor variables

	AoD/SD	TE	RAADS	BAI	TAS	BDI
TE	-.53**	-				
RAADS	.10	-.17*	-			
BAI	-.07	.01	.29**	-		
TAS	.11	-.15*	.32**	.20**	-	
BDI	.07	-.05	.23**	.53**	.26**	-
CAT-Q	-.00	-.19*	.18*	.27**	.22**	.20**

Note. * $p < .05$, ** $p < .01$. AoD/SD: Age of diagnosis/self-diagnosis; TE: Time elapsed since diagnosis/self-diagnosis; RAADS: RAADS-14; BAI: Beck Anxiety Inventory; TAS: Toronto Alexithymia Scale; BDI: Beck Depression Inventory; CAT-Q: Camouflaging Autistic Traits Questionnaire.

In this first set of analyses, the aim was to address whether individual differences in autistic traits, anxiety, alexithymia, depression, and/or camouflaging autistic traits predict individual differences in age of diagnosis/self-diagnosis of autism.

All five predictors were entered simultaneously in multiple regression, with age of diagnosis/self-diagnosis as the dependent variable. This resulted in a non-significant model, $F(5,171) = 1.38$, $p = .233$.

In the next set of analyses, the aim was to address whether individual differences in autistic traits, anxiety, alexithymia, depression, and/or camouflaging autistic traits predict individual differences in the time elapsed since diagnosis/self-diagnosis.

All five predictors were entered simultaneously in a multiple analysis, with time elapsed as the DV. This resulted in a significant model, $F(5,171) = 2.67$, $p = .024$, which explained 7.2% of the variance in the time between diagnosis/self-diagnosis and taking the survey (see Table 11). Specifically, lower levels of camouflaging ($\beta = -0.17$, $p = .028$) predicted higher time elapsed since diagnosis/self-diagnosis. Lower RAADS scores marginally predicted a longer time elapsed ($\beta = -0.14$, $p = .087$). No other variables were significant.

Table 11

Regression results with time elapsed since diagnosis/self-diagnosis as dependent variable.

Predictor	*B*	B CI		*SE B*	β	*p*
		LL	UL			
RAADS	-0.18	-0.38	0.03	0.10	-0.14	.087
BAI	0.07	-0.02	0.16	0.05	0.13	.149
TAS	-0.05	-0.15	0.04	0.05	-0.09	.255
BDI	-0.02	-0.12	0.09	0.05	-0.03	.735
CAT-Q	-0.06	-0.11	-0.01	0.03	-0.17	.028

Note. RAADS: RAADS-14; BAI: Beck Anxiety Inventory; TAS: Toronto Alexithymia Scale; BDI: Beck Depression Inventory; CAT-Q: Camouflaging Autistic Traits Questionnaire.

Group Differences

In this next set of analyses, the aim was to address whether differences exist between groups in each of the five measures (see Table 12 for details). A chi-square analysis found no significant association between group membership and gender, $\chi 2 = 8.47$, $p = .206$.

Table 12

Descriptive statistics for age of diagnosis/self-diagnosis ANOVA groups

ANOVA group	*N*	Mean age of diagnosis/self-diagnosis (*SD*)	Mean age (*SD*)
1. Diagnosed aged 18 or younger	33	11.21 (4.96)	26.79 (6.93)
2. Diagnosed over 18	103	34.57 (10.84)	37.48 (11.05)
3. Self-diagnosed aged 18 or younger	9	14.11 (3.14)	21.22 (3.15)
4. Self-diagnosed over 18	63	34.78 (10.03)	38.51 (10.53)

Note. *N*: Number; *SD*: Standard deviation; ages measured in years.

A one-way MANOVA was conducted on RAADS, BAI, TAS, BDI and CAT-Q scores with diagnostic status and age of diagnosis/self-diagnosis group as independent variable. This variable consisted of four groups, diagnosed aged 18 or younger, diagnosed over 18 years of age, self-diagnosed aged 18 or younger and self-diagnosed over 18. The results are summarised in Table 13. There was a marginally significant difference in task performance based on a participant's age of diagnosis and diagnostic status, F (15, 467) = 1.67, $p = .053$; Wilk's $\Lambda = 0.866$, $\eta_p^2 = .047$. Follow up ANOVAs and contrasts were then conducted on significant variables, namely RAADS and TAS scores.

Table 13

MANOVA results with age of diagnosis/self-diagnosis as fixed factor and contrasts

Variable	*F*	*p*	η_p^2	Contrasts	Cohen's *d* for contrasts
RAADS	3.20	.025	.05	DX > SDX	0.53
				Dx over 18 > self-dx over 18	0.62
				Dx over 18 > dx 18 or under	0.40
				18 or under = over 18	
BAI	0.92	.434	.02		
TAS	1.83	.144	.03	DX = SDX	
				18 or under = over 18	
				Dx over 18 > dx 18 or under	0.45
				Dx over 18 > self-dx over 18	0.41
BDI	0.70	.554	.01		
CAT-Q	0.68	.568	.01		

Note. RAADS: RAADS-14; BAI: Beck Anxiety Inventory; TAS: Toronto Alexithymia Scale; BDI: Beck Depression Inventory; CAT-Q: Camouflaging Autistic Traits Questionnaire.

A one-way ANOVA was conducted with age of diagnosis/self-diagnosis and RAADS scores. The effect of group membership on RAADS scores was significant, $F(3,195) = 5.33$, $p = .002$, $\eta_p^2 = 0.08$. Post hoc analysis with Tukey correction revealed that those diagnosed over 18 ($M = 35.73$, $SD = 4.94$) had significantly higher RAADS scores than those who self-diagnosed aged over 18, ($M = 32.57$, $SD = 5.47$; 3.16, $p = .000$, 95% CI [-4.82, -1.50]). Furthermore, contrasts identified differences between groups as reported in Table 12, notably those who were diagnosed had significantly higher RAADS scores than those who self-diagnosed, (4.46, $p = .038$, 95% CI [0.26, 8.66]).

Group membership was also found to have a significant effect on levels of TAS scores, $F(3,194) = 2.93$, $p = .035$, $\eta_p^2 = .04$. Post hoc tests revealed that participants diagnosed over 18 ($M = 67.14$, $SD = 11.63$) had significantly higher TAS scores than those diagnosed at 18 or younger, ($M = 61.77$, $SD = 12.67$; 5.37, $p = .022$, 95% CI [0.79, 9.94]), and those self-diagnosed over 18, ($M = 62.62$, $SD = 9.61$; 4.52, $p = .016$, 95% CI [0.85, 8.19]). Contrasts revealed no significant differences between the diagnosed and self-diagnosed ($p = .952$) nor the diagnosed/self-diagnosed aged 18 or younger and the diagnosed/self-diagnosed over 18 ($p = .683$).

No other variables or contrasts were significant to $p > .05$.

This final set of analyses aimed to address whether differences exist between four groups of participants (diagnosed less than six years before completing the survey, diagnosed six or more years before completing the survey, self-diagnosed less than six before completing the survey, and self-diagnosed six or more years before completing the survey) in each of the measures (see Table 14 for details). A Chi-square analysis found no significant association between group membership and gender, $\chi 2 = 7.49$, $p = .278$.

Table 14

Descriptive statistics for time elapsed since diagnosis/self-diagnosis ANOVA groups

ANOVA group	*N*	Mean time elapsed since diagnosis/self-diagnosis (*SD*)	Mean age (*SD*)
1. Diagnosed less than 6 years ago	93	1.94 (1.53)	35.77 (11.48)
2. Diagnosed 6 or more years ago	43	14.88 (7.79)	32.95 (10.32)
3. Self-diagnosed less than 6 years ago	54	1.91 (1.55)	35.39 (10.56)
4. Self-diagnosed 6 or more years ago	18	10.94 (4.52)	39.22 (13.71)

Note. *N*: Number; *SD*: Standard deviation; ages measured in years.

A one-way MANOVA was conducted on RAADS, BAI, TAS, BDI and CAT-Q scores with diagnostic status and time elapsed (6yrs) since diagnosing/self-diagnosing and survey participation as independent variable. This variable consisted of four groups, as detailed above. The results are summarised in Table 15. There was a statistically significant difference in variable scores based on the time elapsed since diagnosis/self-diagnosis and a participant's diagnostic status , F (15, 467) = 2.21, $p = .006$; Wilk's $\Lambda = 0.828$, $\eta_p^2 = .06$.

Table 15

MANOVA results with time elapsed as fixed factor and contrasts.

Variable	*F*	*p*	η_p^2	Contrasts	Cohen's *d* for contrasts
RAADS	3.53	.016	.06	DX > SDX	0.53
				DX/SDX recently > DX/SDX longer ago	0.97
				DX recently > SDX recently	0.57
				DX recently > SXD longer ago	1.20
				DX longer ago > SDX longer ago	0.60
				SDX recently > SDX longer ago	0.56
				DX recently > DX longer ago	0.38
BAI	0.25	.862	.00		
TAS	4.85	.003	.08	DX = SDX	
				DX/SDX recently > DX/SDX longer ago	0.35
				DX recently > DX longer ago	0.62
				DX recently > SDX recently	0.47
				DX recently > SDX longer ago	0.52
BDI	0.72	.544	.01		
CAT-Q	3.19	.025	.05	DX = SDX	
				DX/SDX recently > DX/SDX longer ago	0.53
				DX longer ago < DX recently	0.43
				SDX longer ago < SDX recently	0.69

Note. RAADS: RAADS-14; BAI: Beck Anxiety Inventory; TAS: Toronto Alexithymia Scale; BDI: Beck Depression Inventory; CAT-Q: Camouflaging Autistic Traits Questionnaire.

Follow up ANOVAs were conducted on RAADS[6], TAS and CAT-Q scores. The effect of group membership on RAADS score was significant, $F(3, 54) = 6.21$, $p = .001$. Post hoc tests using Games-Howell correction revealed that those diagnosed less than six years ago ($M = 35.86$, $SD = 4.30$) had significantly higher RAADS scores than those who self-diagnosed less than six years ago ($M = 33.26$, $SD = 4.98$; 2.60, $SE = 0.82$, $p = .002$), as well as those who had self-diagnosed six years ago or longer ($M = 30.23$, $SD = 6.56$; 5.62, $SE = 1.70$, $p = .004$). Contrasts also indicated several significant group differences. Diagnosed participants had higher RAADS scores than the self-diagnosed, 6.34, $SE = 2.07$, $p = .004$, and those that were diagnosed or self-diagnosed more recently than six years ago had higher RAADS scores than those diagnosed or self-diagnosed longer ago, 4.91, $SE = 2.07$, $p = .023$. There was a marginally significant difference between the diagnosed less than six years ago group and self-diagnosed more than six years

[6] using Welch method due to significant Levene's test, $p = .043$

ago group, with the former scoring higher, 3.74, *SE* = 1.91, *p* = .060, and between the diagnosed recently and diagnosed longer ago groups, 1.88, *SE* = 1.07, *p* = .084.

The effect of group membership on TAS scores was significant, $F(3, 194) = 4.85$, $p = .003$, $\eta_p^2 = .07$, with Tukey post hoc tests identifying that those with diagnoses received less than six years ago had marginally significantly higher TAS scores than the self-diagnosed six or more years ago group, 5.61, *p* = .081, 95% CI [-0.70, 11.92], and significantly higher scores than those who were diagnosed six or more years ago, 7.15, *p* = .001, 95% CI [3.02, 11.28] and those self-diagnosed less than six years ago, 4.93, *p* = .012, 95% CI [1.11, 8.75]. Planned contrasts also revealed no significant difference between those with diagnoses and those without (*p* = .392), and a significant difference between those diagnosed or self-diagnosed recently and those diagnosed or self-diagnosed longer ago, 7.83, *p* = .049, 95% CI [0.03, 15.63].

Group membership also had a significant effect on CAT-Q scores, $F(3,179) = 3.26$, $p = .023$, $\eta_p^2 = .05$. Post hoc tests revealed that those that had received diagnoses longer ago (*M* = 107.84, *SD* = 21.59) had lower CAT-Q scores than those diagnosed more recently, (*M* = 116.32, *SD* = 19.16; 8.48, *p* = .026, 95% CI [1.01, 15.95]). There was a similar pattern with those that self-diagnosed longer ago (*M* = 107.86, *SD* = 18.40) having marginally significantly lower scores than those self-diagnosed more recently (*M* = 119.37, *SD* = 16.35; 11.52, *p* = .060, 95% CI [-0.50, 23.53]). Contrasts identified a significant difference between the diagnosed or self-diagnosed recently and the diagnosed or self-diagnosed longer ago groups, 20.00, *p* = .006, 95% CI [5.85, 34.15], but no significant difference between the diagnosed and the self-diagnosed (*p* = .669).

Study 2 Discussion

The aim of this study was to conceptually confirm the findings of Studies 1a and 1b. Firstly, this study hypothesised that the measures would explain more variance in the time elapsed since diagnosis/self-diagnosis than the age of diagnosis/self-diagnosis (hypothesis 1a), with lower autistic traits predicting the former and higher autistic traits predicting the latter (H1b and H1c). Study 2 also hypothesised that the diagnosed will report higher levels of autistic traits and lower levels of depression, anxiety and camouflaging than the self-diagnosed (H2). The final hypothesis was that those diagnosed or self-diagnosed less than six years ago will report higher levels of anxiety, depression and camouflaging than those diagnosed or self-diagnosed longer ago (H3). However, contrary to expectations and previous findings, levels of autistic traits, anxiety, alexithymia, depression and camouflaging did not significantly predict age of diagnosis/self-diagnosis. They did predict the time elapsed since diagnosis/self-diagnosis, as expected. Further analysis of the age of diagnosis/self-diagnosis found significant group differences in three out of the five variables, although they were different differences to the previous studies. Most notably alexithymia played a statistically larger role in Study 2 than in Studies 1a and 1b. Group differences in the time elapsed since diagnosis/self-diagnosis variable were also different to Studies 1a and 1b, especially in depression and anxiety scores.

With regards to hypothesis 1a, Study 2 found no significant correlations between the age of diagnosis/self-diagnosis and any of the five independent variables: autistic traits, anxiety, alexithymia, depression and camouflaging. This was not the case with the time elapsed variable. Autistic traits, alexithymia and camouflaging were all found to have negative correlations with the time elapsed since diagnosis/self-diagnosis. Overall, the five measures predicted 7.2% of the variance in the time elapsed, a lower amount of variance than was explained in Studies 1a and 1b, likely because less variables were used. As mentioned in the previous studies' discussion, there are a range of other factors that could influence a person's

reaction to getting a diagnosis or self-identifying as autistic, not least the element of stigma around being autistic as portrayed in the media. This means that the null hypothesis 1a can be rejected as the variables predict variance in time elapsed but not age of diagnosis/self-diagnosis. The finding that autistic traits, alexithymia and camouflaging are lower the longer someone has identified as autistic, is supported by the findings of Studies 1a and 1b. See General Discussion for further analysis.

Whilst regression analysis for the age of diagnosis/self-diagnosis was not significant, correlational analysis indicated a positive, non-significant relationship between autistic traits and age of diagnosis/self-diagnosis. Therefore, H1c is retained. As the relationship between autistic traits and time elapsed since diagnosis/self-diagnosis was negative, H1b can also be retained.

Hypothesis 2 received mixed support from the data, with some relationships following the anticipated direction and others not. The diagnosed participants reported significantly higher levels of autistic traits than the self-diagnosed, as predicted. Whilst this is in keeping with findings from Studies 1a and 1b, it is contrary to Brosnan's (2020) finding that the self-diagnosed reported similar levels of autistic traits to the diagnosed. As expected, based on Studies 1a and 1b, the self-diagnosed reported higher levels of camouflaging than the diagnosed. Confirmation of this finding is useful considering previously discussed theoretical difficulties with the idea that the undiagnosed disguise their autistic traits more than those with diagnoses.

The most surprising element in relation to hypothesis 2 is the lack of relationships or differences between groups in the anxiety and depression measures. Although both of the Beck inventories were significantly correlated with the other IVs, they had no impact on either the age of diagnosis/self-diagnosis or the time elapsed since diagnosis/self-diagnosis. This calls

into question the idea of a post diagnostic transition period as originally discussed by Corden, Brewer and Cage (2021). This is discussed further in the General discussion.

Hypothesis 3 also had mixed results with no significant differences in time elapsed in the proposed variables except for camouflaging scores, which were significantly higher in those who were recently diagnosed or self-diagnosed. This suggests that after some time, autistic people tend to camouflage less, perhaps because they have adjusted to being autistic. Theoretically, this could be part of a post diagnostic/self-diagnostic identity acceptance, with similar routes to Corden et al.'s transition period. However, without more information on participant's identity before and after diagnosis or self-diagnosis, it is impossible to comment further.

Study 2 found a significant correlation between camouflaging and alexithymia, which was not apparent in studies 1a and 1b. This relationship might have been swamped by all the other 11 variables in studies 1a and 1b, therefore highlighting a strength of study 2 in being able to be more focused on just five IVs. Evidence has suggested that masking autistic traits is often a subconscious reaction, which theoretically does not require a huge amount of introspection (Pearson & Rose, 2021). A possible synonym for introspection, externally orientated thinking is also an element in those with high levels of alexithymia (Bagby, Parker & Taylor, 1994). As camouflaging and alexithymia have both been linked to mental health problems in autistic people, this is an area that warrants further investigation, specifically into similarities between the cognitive mechanisms behind masking and alexithymia.

Whilst not officially hypothesised, it was expected that more self-diagnosed people would volunteer to participate in Study 2, given evidence that as a group they appeared keen to be more accepted in autism research (Lewis, 2016a). At least two self-diagnosed participants ticked the wrong box when asked if they had official diagnoses, as evidenced by comments they made in the location of diagnosis text box. Their data was moved to the self-diagnosed

group so as to not waste their contribution. It is possible that other people were lying about their diagnostic status, which although not very helpful for the sake of scientific exploration, does show how committed some undiagnosed people are to the autistic identity.

General Discussion

This project set out to address three broad questions:

1. Do individuals who received a diagnosis of an ASC in childhood differ in a range of variables from those who realised they are autistic as adults? (the age of autism diagnosis)
2. Do those without official diagnoses differ from those with official diagnoses? (the lack of diagnosis)
3. What role, if any, does the time elapsed since diagnosis or self-diagnosis of ASC play in these results? (the recency of diagnosis)

By exploring relationships between a range of variables and the age a person was either diagnosed with an ASC or self-diagnosed themselves as autistic, as well as the time elapsed since that diagnosis or self-diagnosis, it is hoped that this study has shed some light onto key aspects of autism research. Growing numbers of adult autism diagnoses as well as a large community of self-diagnosed individuals suggests a need for a better understanding of how autistic people can escape detection for so long. Mental health difficulties experienced by late diagnosed autistic people highlight a need for research into the effect of often life changing diagnoses and how these difficulties change over time.

With so many results to consider, it is necessary for this final discussion to refer to the variable categories used in the introduction to give a clear overview of what this research tells us.

Mental Health

The current studies were planned in light of well-documented links between ASC and mental health issues (for example Buck et al., 2014), as well as evidence implying a negative relationship between age of diagnosis and better life outcomes (Volkmar, 2014). Overall, this research does not support this evidence, having failed to find a consistent relationship

between depression, anxiety or alexithymia with age of diagnosis. Whilst studies 1a and 1b found marginally significant links to the age a person was diagnosed or self-diagnosed, study 2 was not able to replicate the links to a significant level.

This was also the case with the time elapsed variable meaning that this research does not appear to support Corden, Brewer and Cage's (2021) theory of a post-diagnostic adjustment period. If this period was present, we would have expected to see significantly lower levels of anxiety and depression in those diagnosed (and perhaps self-diagnosed) more than six years ago. In contrast, this study found no significant differences between the diagnosed or self-diagnosed less than six years ago and those diagnosed or self-diagnosed six or more years ago in anxiety or depression.

Both studies found that alexithymia was positively correlated with depression and anxiety, which were unsurprisingly also positively linked to each other. This was to be expected given evidence from Marchesi et al. (2000) and others. More surprising is the lack of a relationship between autistic traits and depression and anxiety in studies 1a and 1b. This goes against existing evidence (Albantakis et al., 2018; Lai et al., 2019) and a strong correlation between all three variables in Study 2. The main differences between the first studies and study 2 were the use of the RAADS-14 instead of the AQ and the location of participants. Therefore, the lack of correlation between autistic traits with depression and anxiety is either based on an issue with the AQ or a random sampling anomaly, possibly based on cultural or language differences.

Social and Behavioural

Despite existing evidence that childhood behaviour can be important in early diagnoses, with the more badly behaved coming to the attention of parents and/or teachers before those without behavioural issues (Zwaigenbaum et al., 2019), the only hint of this in the current studies was that worse childhood behaviour was linked to a longer time elapsed since diagnosis/self-diagnosis. As the childhood traits were measured in a very basic way, with one

question per trait, psychometric data on these variables could not be obtained. Therefore, relationships with the age of diagnosis/self-diagnosis might have been missed as a result of poor psychometric properties of the original measures used in the current study. As mentioned in the discussion for Studies 1a and 1b, the relationships between childhood traits and age of diagnosis/self-diagnosis might be better analysed using tried and tested quantitative, or even qualitative, methods.

The main behavioural variable that the current studies investigated was camouflaging, which featured heavily in the results of all three studies. As noted in previous research positive correlations between camouflaging and autistic traits, depression and anxiety were observed. Although its marginally significant correlation with age of diagnosis/self-diagnosis from the first studies was not replicated in study 2, the strong, negative relationship with time elapsed was evident in all studies. This suggests that the longer ago a person was diagnosed/self-diagnosed, the less they camouflage their behaviour. It is also backed up by the results of both time elapsed ANOVAs, with the recently diagnosed/self-diagnosed scoring higher in the CAT-Q than those diagnosed/self-diagnosed longer ago. This finding, which was consistent throughout analysis, supports Corden et al.'s idea that people adjust to their autistic identity by reducing the amount of camouflage needed. It also supports Hull and colleagues work, in that the motivation proposed to be at the root of camouflaging behaviour to fit in with neurotypicals is likely to reduce as people begin to fit in with other autistic people. As the CAT-Q is still relatively new, further exploration is likely to give rise to similar findings.

Cognitive Abilities

Performance on the Reading the Mind in the Eyes task was negatively associated with levels of autistic traits and alexithymia, confirming previous links between mentalising and both autism and alexithymia (Baron-Cohen et al., 2001; Oakley, Brewer, Bird & Catmur, 2016). However, performance on the Reading the Mind in the Eyes task was not related to either age of

diagnosis/self-diagnosis or time elapsed since diagnosis/self-diagnosis in Studies 1a and 1b, hence its exclusion from Study 2. Some have questioned whether RMIE is the best measure of mentalising, or even a measure of mentalising at all (e.g. Oakley et al., 2016). Although the task has good face validity and distinguishes well between autistic and non-autistic individuals regardless of whether or not those individuals have alexithymia (see e.g., Nicholson et al. 2018), it may not be an ideal measure. Rather than taking these current studies as proof that no relationship exists between theory of mind and age or recency of diagnosis or self-diagnosis, future investigation should consider a different task or method, such as video-based tasks or multiple measures. It is possible that there could be a number of confounding variables on the RMIE task that could obscure a significant effect, involved in remaining undiagnosed until adulthood, including whether someone was forced to make eye contact as a child.

The finding that working memory could be involved in age of diagnosis, with those diagnosed over 18 demonstrating greater working memory performance than is perhaps the most interesting result of the first studies. A superior working memory could be the thing that separates those who are not diagnosed till later in life, or at all, and those that are diagnosed in a timely manner. Given evidence that working memory naturally deteriorates with age (Craik & Salthouse, 2008), this natural deterioration is perhaps what finally leads to an autism diagnosis.

Whilst it was hypothesised that a better working memory would result in better camouflaging abilities studies 1a and 1b found no link between the digit span task and camouflaging autistic traits questionnaire. This suggests that if working memory is a significant factor in age of diagnosis, it is not by means of better masking. This supports the findings of Somerville et al. (2019). If a link between age of autism diagnosis and working memory can be replicated, possible links between working memory and other autistic traits should be investigated. These

autistic traits could include restricted and repetitive behaviours, given evidence that lower verbal working memory scores were associated with more repetitive and restricted behaviours (Kercood, Grskovic, Banda & Begeske, 2014). Social communication differences might also be an avenue to explore as evidence suggests a better working memory in autistic child results in better social communication skills (Baixauli-Fortea et al., 2017). Both greater social communication and fewer RRBIs could result in later or no diagnosis of autism.

Self-Diagnosis

Several individual analyses alluded to differences between the self-diagnosed and those participants with official diagnoses. The most consistent of these differences was in levels of autistic traits. The majority of ANOVA results suggest that the diagnosed report significantly higher levels of autistic traits, whether measured by the AQ (Baron-Cohen et al., 2001) or the RAADS-14 (Eriksson, Andersen & Bejerot, 2013). On the one hand, this might be surprising, given evidence of misdiagnosis and qualitative evidence of self-diagnosed people having difficulties getting official diagnoses (Luciano et al., 2014; Sarrett, 2016). On the other hand, just under 10% of self-diagnosed participants from Study 1b had been refused ASC diagnoses and the majority of self-diagnosed participants over the two studies had not sought official diagnoses for ASC. This suggests that at least some of the participants who identify as autistic may not receive a clinical diagnosis were they to seek one.

This confirmation of major differences in levels of autistic traits has potentially far-reaching implications. Many autism advocacy groups, including Autistica, embrace self-diagnosed people into autistic communities, giving them equal treatment. Even if a person does not have nefarious intentions, this unquestioning acceptance could be damaging for the autistic people in the group as well as disguising other disorders that have been mislabelled as an ASC. It is one thing to identify a significant difference between the self-diagnosed and the diagnosed. However, without faster, more efficient diagnostic practices not much can be done without

risking those who genuinely are autistic, but have no means to get diagnosed, being disadvantaged, such as those in countries where healthcare is not free. It also raises questions about how best to help the self-diagnosed, especially those who will never reach the clinical threshold of being autistic.

Autistic Adults

Considering evidence that the majority of autistic people are male (Johnson & Meyer, 2007), the current studies had a surprisingly high number of participants who identify as female. This was likely a sampling issue based on the majority of the online groups used for recruitment being specifically for women. However, given evidence that the disparity between genders might not be as large as previously believed (Lai, Baron-Cohen & Buxbaum, 2015), the sampling issue might not be too significant. Gender differences in autistic samples can be difficult to identify given the amount of gender non-conformity among autistic people. This current research has found no evidence that this gender equalising is due to women being diagnosed later than men, although it should not be ruled out. Further research should consider a less binary view of gender and autism diagnosis because much like mental health conditions can mislead diagnoses, gender non-conformity could also over shadow autistic traits.

Strengths

One of the main gaps in autistic literature that these studies aimed to fill was the lack of research on autistic adults. The field is also still lacking in research by autistic people so the fact that this research was conducted primarily by a late diagnosed autistic adult is definitely a strength. It is hoped that this will encourage others to investigate big questions that exist in the autistic community, as well as showing neurotypical researchers how essential autistic participation can be.

The main strength of this study was the amount of quantitative data it amassed, especially from individuals who self-identify as autistic. At the time of writing, the only quantitative information was Bronson's study (2020) which just looked at scores to two questions (one to gauge levels of social issues and the other, levels of RRBIs). By collecting data on seven main measures as well as basic information on childhood traits, we are able to better understand this population, including the controversial decision to self-diagnose. Although this is important data, the heterogenous nature of this group needs to be considered.

This study also identified some previously undiscovered evidence regarding camouflaging and recency and lack of autism diagnosis. It also hinted toward a possible relationship between working memory and age of autism diagnosis. All of these findings can be used to inspire further research to help future implication of assistance for autistic adults, whether self-identified or clinically diagnosed.

Limitations

Practical limitations include time constraints and the previously mentioned gender disparity. Also, participants were split into ANOVA groups quite arbitrarily, with the age of diagnosis/self-diagnosis groups being at 18 years old and the recency of diagnosis groups being split around the mean time elapsed since diagnosis. In the first case this resulted in uneven group sizes. This is likely to be because of the link between levels of functioning ability and delayed diagnosis, with those being diagnosed later generally being reasonably independent and without learning difficulties. In the case of the time elapsed groups, the groups were more even in size, however, the arbitrary nature of this divide might call into question the plausibility of any implications. A larger and wider sample would improve group equality, ensuring statistically impeccable results.

Implications

The current studies are the first to include quantitative data on age of diagnosis and/or self-diagnosis and therefore fills a gap in existing research. As well as supplying much needed information on previously under researched groups, it suggests various points to follow up on to discover more about how some people can reach adulthood without knowing they are autistic. The implications of such research are vast, including better post diagnostic services, better diagnosing in general and a greater understanding of autistic people throughout their lifetimes, not just as children. With the finding that autistic adults still camouflage after diagnosis, strategies to help alleviate that could be to have more opportunities for autistic people to socialise with other autistic people.

It is also hoped that this research, as well as any that furthers investigations in a similar vein, will assist the self-diagnosed, whether it be with better access to diagnostic services or another way to understand their symptoms. Given the high levels of anxiety and depression reported by the self-diagnosed, research that could lead to a solution should be prioritised. For instance, establishing how much of an individual's anxiety and/or depression is due to camouflaging their autistic traits might enable professionals to facilitate social interaction with autistic people to lessen the need for masking. The knowledge that self-diagnosed people are camouflaging sometimes more than officially diagnosed autistic people, is an important point for those developing screening and diagnostic tools and methods.

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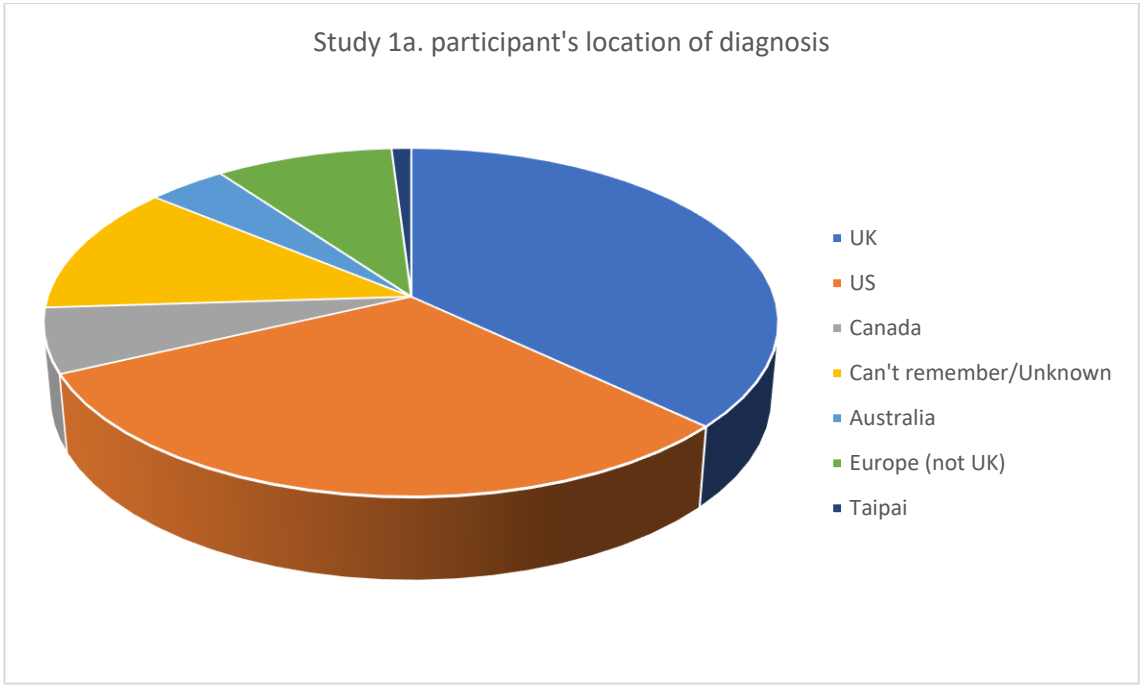
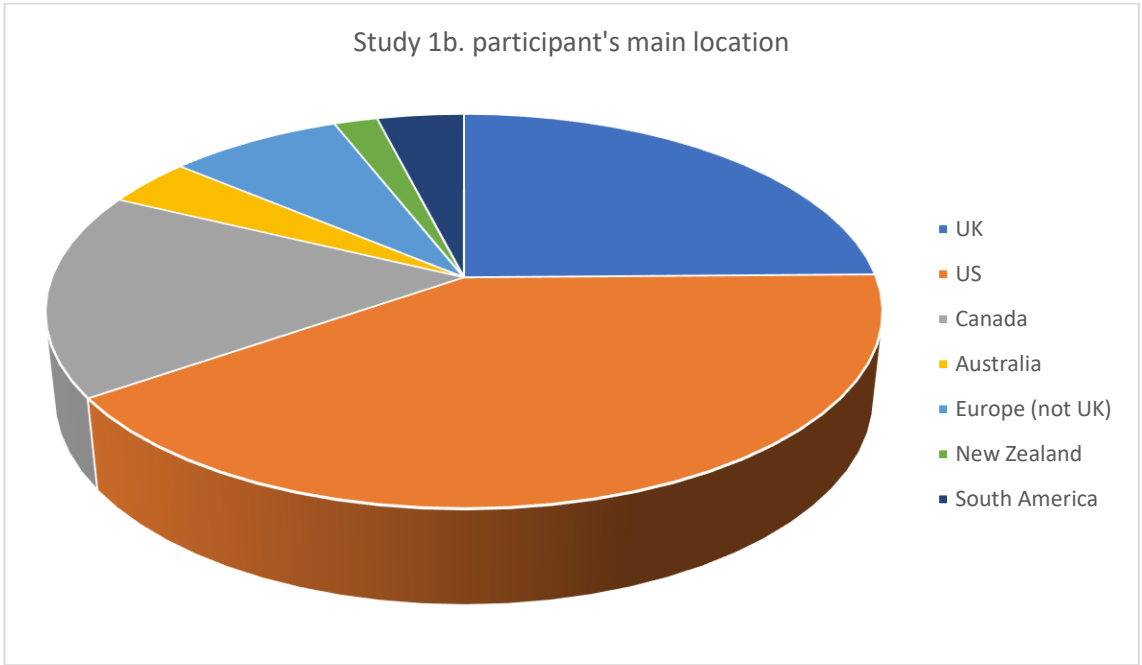
Appendix A

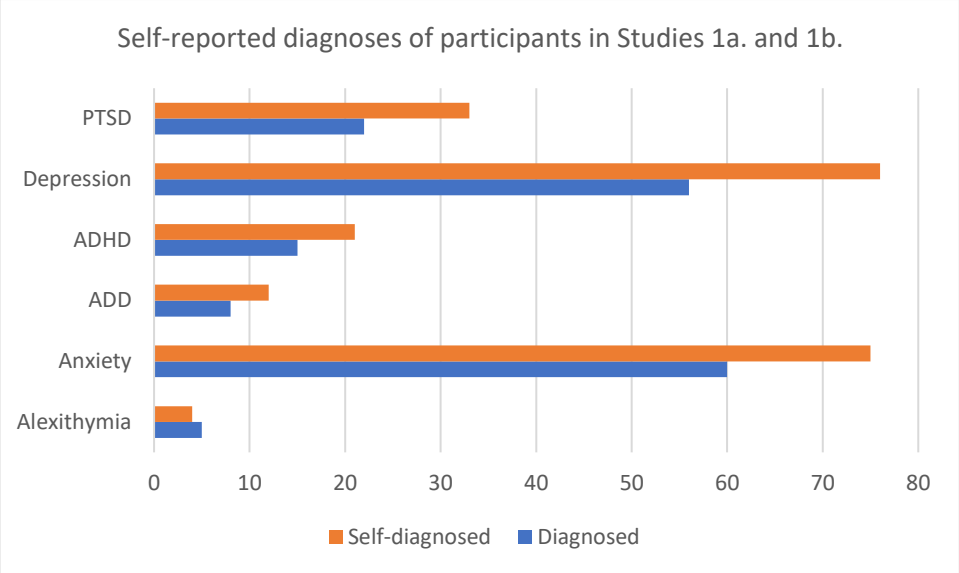
Participant locations





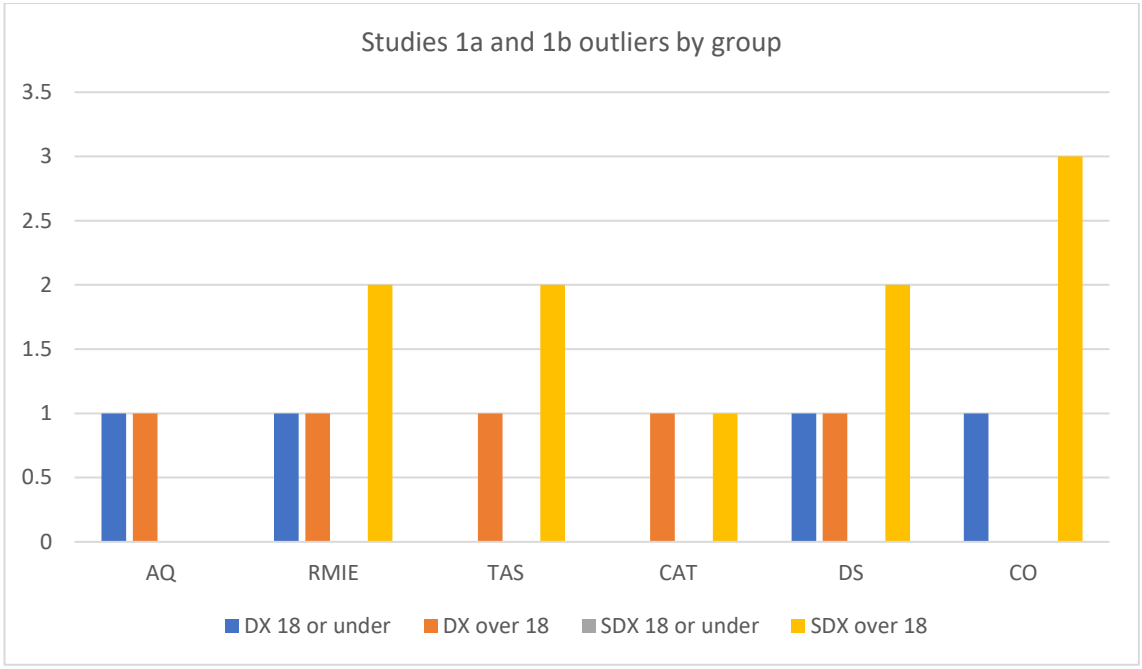
Appendix B

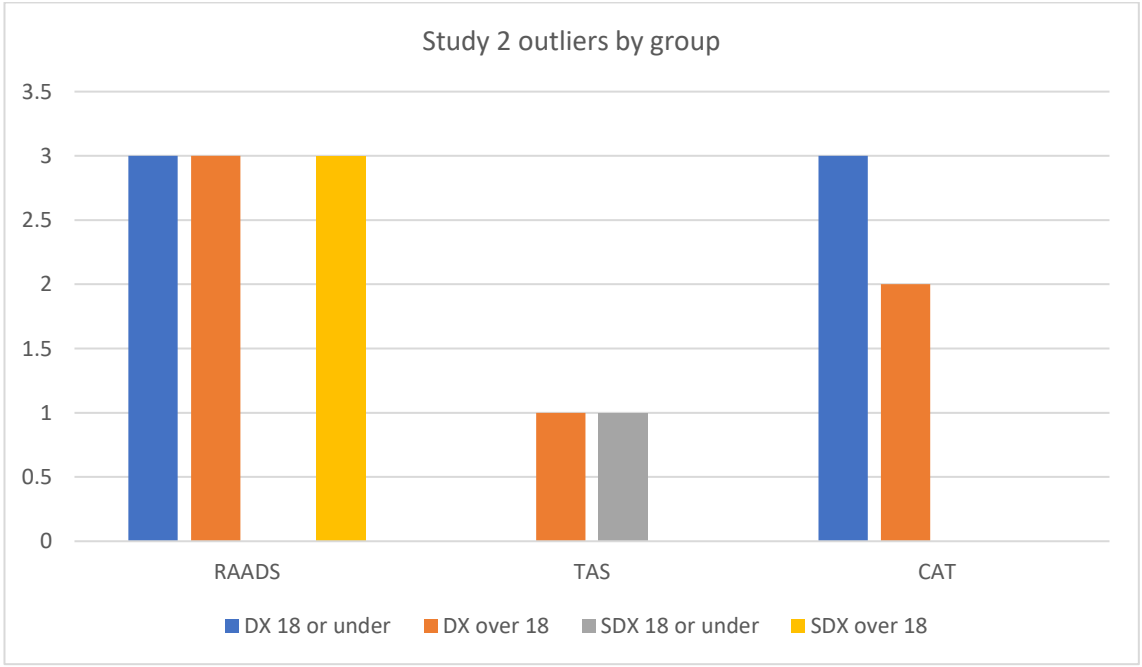
Other diagnoses reported by participants



Appendix C

Removed outliers by group





Appendix D

Study 1a & Study 1b results with outliers

Individual Differences

Descriptive statistics for survey measures can be viewed in Table 1a.

A series of correlation analyses was conducted in order to explore the associations between all 12 independent variables and two dependent variables. These two dependent variables were age of diagnosis/self-diagnosis and time elapsed since diagnosis/self-diagnosis. In the first set of analyses (see Table 2a), all groups were collapsed. In order to establish whether the magnitude of associations between variables differed significantly by diagnostic status (diagnosed or self-diagnosed), correlation analyses were conducted in each group separately. Fisher's Z tests, which were conducted to establish whether associations differed in magnitude between groups, were not significant.

Among the whole sample, AQ was positively correlated with age of diagnosis/self-diagnosis and negatively correlated with time elapsed since diagnosis/self-diagnosis. Both correlations were significant and weak. Age of diagnosis/self-diagnosis also had small, marginally significant relationship with CO and a significant correlation with CB, that were both negative. Time elapsed since diagnosis/self-diagnosis was negatively correlated with all of the main IVs and a significantly relationship was observed with all of the main IVs except RMIE and DS. Time elapsed was also marginally significantly correlated with CB. The two DVs had a highly significant, moderate negative relationship, $r(201) = -.43$, $p < .001$.

Table 1a

Descriptive statistics for Study 1a and Study 1b survey measures

Measure	*N*			*M* (*SD*)			Range		
	Total	DX	SDX	Total	DX	SDX	Total (possible)	DX	SDX
AQ	200	100	100	37.52 (5.70)	38.33 (6.09)	36.71 (5.19)	13-48 (0-50)	13-47	25-48
RMIE	201	100	101	23.18 (6.58)	22.54 (7.20)	23.81 (5.86)	0-34 (0-36)	0-34	3-32
BDI	201	100	101	43.55 (12.33)	42.10 (12.69)	44.99 (11.86)	21-79 (21-84)	21-76	23-79
BAI	201	100	101	44.14 (13.30)	40.68 (12.08)	47.57 (13.62)	21-76 (21-84)	21-71	23-76
TAS	201	100	101	64.40 (11.52)	64.17 (11.77)	64.63 (11.32)	23-91 (20-100)	29-91	23-90
CAT-Q	201	100	101	127.10 (25.16)	121.27 (26.01)	132.88 (22.99)	50-171 (25-175)	50-166	61-171
DS	201	100	101	12.53 (4.36)	12.47 (4.50)	12.58 (4.23)	0-20 (0-21)	0-20	0-19.75
CD	192	95	97	6.30 (2.38)	5.95 (2.18)	6.65 (2.53)	1-10 (0-10)	1-10	1-10
CA	194	96	98	7.48 (2.18)	7.47 (2.05)	7.49 (2.31)	2-10 (0-10)	2-10	2-10
CS	196	98	98	6.59 (2.37)	6.40 (2.37)	6.78 (2.36)	1-10 (0-10)	1-10	1-10
CO	201	100	101	4.12 (1.97)	3.99 (1.91)	4.24 (2.02)	0-10 (0-10)	0-10	0-10
CB	201	100	101	3.50 (2.52)	3.28 (2.48)	3.75 (2.55)	0-10 (0-10)	0-10	0-10

Note. DX: Diagnosed respondents; SDX: Self-diagnosed respondents; AQ: Autism-Spectrum Quotient; RMIE: Reading the Mind in the Eyes task; BDI: Beck Depression Inventory; BAI: Beck Anxiety Inventory; TAS: Toronto Alexithymia Scale; CAT-Q: Camouflaging Autistic Traits Questionnaire; DS: Digit span task; CD: Childhood depression; CA: Childhood anxiety; CS: Childhood sensitivity; CO: Childhood outgoingness; CB: Childhood behaviour.

Table 2a

Correlations among predictor variables

	AoD/SD	TE	AQ	RMIE	BDI	BAI	TAS	CAT-Q	DS	CD	CA	CS	CO
TE	-.43**	-											
AQ	.15*	-.16*	-										
RMIE	.00	-.04	-.33**	-									
BDI	-.05	-.20**	.10	-.08	-								
BAI	-.12	-.17*	.02	-.05	.69**	-							
TAS	.03	-.14*	.42**	-.32**	.32**	.24**	-						
CAT-Q	-.12	-.26**	.09	.09	.22**	.39**	.16*	-					
DS	.10	-.10	.12	.05	-.01	.01	.06	.06	-				
CD	.08	-.08	.07	.01	.40**	.36**	.10	.19**	.07	-			
CA	-.08	.00	-.01	-.17*	.24**	.41**	.04	.20**	.03	.46**	-		
CS	-.11	.05	.21**	-.31**	.14m	.27**	.19**	.15*	.01	.27**	.38**	-	
CO	-.14m	.01	-.19**	.11	-.08	-.06	-.19**	-.00	-.10	-.02	-.15*	-.01	-
CB	-.15*	.13m	-.05	-.12	.06	.16*	.13	-.03	.02	.02	.04	.15*	.34**

Note. m: $p < .10$, * $p < .05$, ** $p < .01$. AoD/SD: Age of diagnosis/self-diagnosis; TE: Time elapsed since diagnosis/self-diagnosis; AQ: Autism-Spectrum Quotient; RMIE: Reading the Mind in the Eyes task; BDI: Beck Depression Inventory; BAI: Beck Anxiety Inventory; TAS: Toronto Alexithymia Scale; CAT-Q: Camouflaging Autistic Traits Questionnaire; DS: Digit span task; CD: Childhood depression; CA: Childhood anxiety; CS: Childhood sensitivity; CO: Childhood outgoingness; CB: Childhood behaviour.

Age of Diagnosis/Self-Diagnosis

In this first set of analyses, the aim was to address whether individual differences in autistic traits, mindreading/theory of mind, depression, anxiety, alexithymia, camouflaging autistic traits, and/or digit span score predict individual differences in age of diagnosis/self-diagnosis of autism.

A hierarchical regression was conducted to establish whether levels of childhood traits and the seven main IVs predicted age of diagnosis or self-diagnosis. The first step included childhood depression, childhood anxiety, childhood sensitivity, childhood outgoingness and childhood behaviour. This model explained 6.6% of the variance in age of diagnosis/self-diagnosis, and was significant, $F(5, 181) = 2.57$, $p = .029$. The second step added the five main predictor variables (autism-spectrum quotient scores, reading the mind in the eyes scores, Beck depression inventory scores, Beck anxiety inventory scores, Toronto alexithymia scale scores, camouflaging autistic traits questionnaire scores and digit span scores). This model explained an additional 4.8% of the variance in age of diagnosis/self-diagnosis, which was a non-significant increase, $F(7, 174) = 1.35$, $p = .231$. This final model was significant, $F(12,174) = 1.87$, $p = .049$, and explained 11.4% of the variance in age of diagnosis/self-diagnosis (see Table 3a). Specifically, higher levels of childhood depression ($\beta = 0.20$, $p = .026$) significantly and autism-spectrum quotient scores ($\beta = 0.15$, $p = .077$) marginally significantly predicted higher age of diagnosis/self-diagnosis. No other variables were significant.

Table 3a

Hierarchical regression results with age of diagnosis/self-diagnosis as dependent variable.

Predictor	B	B CI		SE B	β	*p*
		LL	UL			
Step one						
CD	1.00	0.05	1.94	0.48	0.17	.039
CA	-0.89	-1.97	0.20	0.55	-0.14	.110
CS	-0.56	-1.48	0.37	0.47	-0.09	.236
CO	-0.90	-1.99	0.20	0.55	-0.13	.107
CB	-0.50	-1.35	0.35	0.43	-0.09	.245
Step two						
CD	1.15	0.14	2.16	0.51	0.20	.026
CA	-0.53	-1.69	0.63	0.59	-0.08	.370
CS	-0.77	-1.75	0.21	0.50	-0.13	.123
CO	-0.59	-1.73	0.55	0.58	-0.08	.307
CB	-0.52	-1.41	0.37	0.45	-0.09	.248
AQ	0.37	-0.04	0.77	0.21	0.15	.077
RMIE	0.01	-0.35	0.36	0.18	0.00	.979
BDI	-0.09	-0.33	0.15	0.12	-0.08	.476
BAI	-0.02	-0.26	0.22	0.12	-0.02	.870
TAS	0.02	-0.19	0.23	0.11	0.02	.839
CAT-Q	-0.06	-0.15	0.02	0.05	-0.12	.154
DS	0.27	-0.19	0.74	0.24	0.08	.251

Note. CD: Childhood depression; CA: Childhood anxiety; CS: Childhood sensitivity; CO: Childhood outgoingness; CB: Childhood behaviour; AQ: Autism-Spectrum Quotient; RMIE: Reading the Mind in the Eyes task; BDI: Beck Depression Inventory; BAI: Beck Anxiety Inventory; TAS: Toronto Alexithymia Scale; CAT-Q: Camouflaging Autistic Traits Questionnaire; DS: Digit span task.

Time Elapsed Since Diagnosis/Self-Diagnosis

In the next set of analyses, the aim was to address whether individual differences in autistic traits, theory of mind, depression, anxiety, alexithymia, camouflaging autistic traits, digit span score and/or childhood traits predict individual differences in the time elapsed since diagnosis/self-diagnosis.

All 12 predictors were entered into a hierarchical regression, with time elapsed as the DV. Step one, consisting of the five childhood trait scores, created a non-significant model, $F(5,181) = 1.06$, $p = .387$. The seven main variables were added into step two, and this resulted in a significant increase, $F(7,174) = 3.69$, $p = .001$. The final model was significant, $F(12,174) = 2.64$, $p = .003$, and explained 15.4% of the variance in time elapsed since diagnosis/self-diagnosis (Table 4a). Bad

behaviour as a child predicted a longer time since diagnosis (β = 0.16, *p* = .048), whilst higher AQ scores (β = -0.14, *p* = .095) marginally significantly and higher CAT-Q scores (β = -0.20, *p* = .012) significantly predicted lower time elapsed since diagnosis/self-diagnosis.

Table 4a

Hierarchical regression results with time elapsed since diagnosis/self-diagnosis as dependent variable.

Predictor	B	B CI		SE B	β	*p*
		LL	UL			
Step one						
CD	-0.43	-1.10	0.24	0.34	-0.11	.207
CA	0.10	-0.67	0.88	0.39	0.02	.792
CS	0.19	-0.46	0.85	0.33	0.05	.566
CO	-0.16	-0.93	0.62	0.39	-0.03	.692
CB	0.53	-0.07	1.13	0.31	0.14	.084
Step two						
CD	-0.00	-0.69	0.68	0.35	-0.00	.993
CA	0.16	-0.63	0.95	0.40	0.04	.686
CS	0.48	-0.19	1.15	0.34	0.12	.158
CO	-0.45	-1.23	0.32	0.39	-0.09	.250
CB	0.61	0.01	1.21	0.31	0.16	.048
AQ	-0.24	-0.51	0.04	0.14	-0.14	.095
RMIE	-0.03	-0.27	0.21	0.12	-0.02	.778
BDI	-0.10	-0.26	0.07	0.08	-0.12	.250
BAI	-0.05	-0.21	0.11	0.08	-0.07	.546
TAS	-0.05	-0.19	0.09	0.07	-0.06	.480
CAT-Q	-0.08	-0.14	-0.02	0.03	-0.20	.012
DS	-0.20	-0.52	0.12	0.16	-0.09	.211

Note. CD: Childhood depression; CA: Childhood anxiety; CS: Childhood sensitivity; CO: Childhood outgoingness; CB: Childhood behaviour; AQ: Autism-Spectrum Quotient; RMIE: Reading the Mind in the Eyes task; BDI: Beck Depression Inventory; BAI: Beck Anxiety Inventory; TAS: Toronto Alexithymia Scale; CAT-Q: Camouflaging Autistic Traits Questionnaire; DS: Digit span task.

Group Differences

Age of Diagnosis/Self-Diagnosis

In this next set of analyses, the aim was to address whether differences exist between groups (diagnosed 18 or under, diagnosed over 18, self-diagnosed 18 or under and diagnosed over 18) in each of the measures.

A one-way MANOVA was conducted on AQ, RMIE, BDI, BAI, TAS, CAT, DS, CD, CA, CS, CO and CB scores with diagnostic status and age of diagnosis/self-diagnosis group as independent variable. This variable consisted of four groups, diagnosed aged 18 or younger, diagnosed over 18 years of age, self-diagnosed aged 18 or younger and self-diagnosed over 18. The results are summarised in Table 5a. There was a significant difference in task performance based on a participant's age of diagnosis and diagnostic status, F (36, 497) = 1.57, p = .020; Wilk's Λ = 0.727, η_p^2 = .10. Follow up ANOVAs were then conducted on AQ, BAI, CAT-Q and DS scores. Contrasts were run to test differences between the diagnosed and the self-diagnosed and between those diagnosed/self-diagnosed aged 18 or under and those diagnosed over 18 in AQ, BAI, CAT-Q and DS scores. All contrasts were run separately, therefore no Bonferroni correction was necessary. Data is presented as mean ± standard deviation.

Table 5a

MANOVA results with age of diagnosis/self-diagnosis as fixed factor and contrasts

Variable	*F*	*p*	η_p^2	Contrasts	Cohen's *d* for contrasts
AQ	3.15	.026	.05	Dx 18 or under < dx over 18	0.41
				Dx over 18 > self-dx over 18	0.46
				DX = SDX	
				18 or under = over 18	
RMIE	0.70	.552	.01		
BDI	1.00	.395	.02		
BAI	5.09	.002	.08	Dx over 18 < self-dx over 18	0.50
				Dx 18 or under < self-dx 18 or under	0.80
				Dx over 18 < self-dx 18 or under	0.81
				DX < SDX	0.66
				18 or under = over 18	
TAS	1.43	.235	.02		
CAT-Q	3.29	.022	.05	Dx over 18 < self-dx over 18	0.43
				Dx 18 or under < self-dx over 18	0.52
				DX < SDX	0.55
				18 or under = over 18	
DS	3.05	.030	.05	18 or under = over 18	
				Dx 18 or under < dx over 18	0.64
				Dx 18 or under < self-dx over 18	0.47
				DX = SDX	
CD	1.78	.154	.03		
CA	0.26	.852	.00		
CS	0.77	.515	.01		
CO	1.42	.238	.02		
CB	1.07	.364	.02		

Note. AQ: Autism-Spectrum Quotient; RMIE: Reading the Mind in the Eyes task; BDI: Beck Depression Inventory; BAI: Beck Anxiety Inventory; TAS: Toronto Alexithymia Scale; CAT-Q: Camouflaging Autistic Traits Questionnaire; DS: Digit span task; CD: Childhood depression; CA: Childhood anxiety; CS: Childhood sensitivity; CO: Childhood outgoingness; CB: Childhood behaviour.

A one-way ANOVA was conducted to determine if AQ scores were different for groups with different diagnostic status and age of diagnosis/self-diagnosis. AQ score was statistically significantly different between different groups, $F(3, 196) = 2.96$, $p = .033$. AQ score increased from the diagnosed 18 or under ($M = 36.44$, $SD = 7.39$) to the self-diagnosed over 18 ($M = 36.66$, $SD = 5.27$), the self-diagnosed 18 or under ($M = 37.09$, $SD = 4.77$), and diagnosed over 18 ($M = 39.11$, $SD = 5.34$) groups, in that order. Tukey post hoc analysis revealed that the mean difference between those that were diagnosed over 18 and those that were self-diagnosed over 18 (-2.45, 95% CI [-4.22, -0.68]) was statistically significant ($p = .007$). The difference between the

diagnosed 18 or younger and the diagnosed over 18 groups was also significant, -2.67, p = .032, 95% CI [-5.12, -0.21]. No other group differences were statistically significant.

A one-way ANOVA found that the effect of group membership on BAI scores was significant, $F(3,197) = 5.31$, $p = .002$. BAI mean scores ranged from the diagnosed over 18 ($M = 40.62$, $SD = 12.11$) to the diagnosed aged 18 or younger ($M = 40.81$, $SD = 12.20$), the self-diagnosed over 18 ($M = 46.98$, $SD = 13.35$) and self-diagnosed 18 or under ($M = 51.92$, $SD = 15.40$). Post hoc analysis identified three significant differences between groups. Those who self-diagnosed over 18 had significantly higher BAI scores than those who were diagnosed aged over 18 (11.30, 95% CI [3.36, 19.23], $p = .005$) and those who were diagnosed 18 or under (11.11, 95% CI [2.38, 19.83], $p = .013$). The diagnosed over 18 group also had significantly lower BAI scores than the self-diagnosed over 18 group, 6.37, 95% CI [2.32, 10.41], $p = .002$. A contrast confirmed that the diagnosed had lower BAI scores than the self-diagnosed overall, 17.47, 95% CI [-27.09, -7.85], $p < .001$.

Group membership, tested with a one-way ANOVA, was also found to have a significant effect on CAT-Q scores, $F(3,197) = 3.91$, $p = .010$, $\eta_p^2 = .06$. CAT-Q score increased from the diagnosed age 18 or younger ($M = 119.29$, $SD = 27.79$) to the diagnosed over 18 ($M = 122.07$, $SD = 25.42$), the self-diagnosed over 18 ($M = 132.41$, $SD = 22.88$) and the self-diagnosed aged 18 or younger ($M = 136.42$, $SD = 24.53$). Post hoc tests showed that the diagnosed participants reported lower levels of camouflaging than the self-diagnosed over 18s, regardless of whether they were diagnosed aged 18 or younger, (13.11, $p = .014$, 95% CI [2.73, 23.50]) or over the age of 18, (10.34, $p = .009$, 95% CI [2.61, 18.06]). Contrasts found that the self-diagnosed reported higher CAT-Q scores than the diagnosed, (27.46, $p = .004$, 95% CI [9.08, 45.84]), but no significant difference between those diagnosed or self-diagnosed aged 18 or under and those diagnosed or self-diagnosed over 18 ($p = .895$).

A one-way ANOVA was conducted to investigate the effect of group membership on DS scores, $F(3,197) = 2.86$, $p = .038$. Post hoc analysis found a statistically significant difference in DS score

between the diagnosed over 18 group (*M* = 13.27, *SD* = 4.42) and the diagnosed 18 or under group (*M* = 10.52, *SD* = 4.13), a mean difference of 2.76 (*p* = .004, 95% CI [0.89, 4.63]) and the self-diagnosed over 18 group (*M* = 12.54, *SD* = 4.44; *p* = .029, 95% CI [0.21, 3.83]). No other significant differences were identified, including between the diagnosed at any age and the self-diagnosed at any age groups (*p* = .313) or the diagnosed/self-diagnosed aged 18 or younger and the diagnosed/self-diagnosed over 18 (*p* =.142).

Time Elapsed Since Diagnosis/Self-Diagnosis

This final set of analyses aimed to address whether differences exist between four groups of participants (diagnosed less than six years before completing the survey, diagnosed six years or more before completing the survey, self-diagnosed less than six years before completing the survey and self-diagnosed six or more years before completing the survey) in each of the measures.

A one-way MANOVA was conducted on AQ, RMIE, BDI, BAI, TAS, CAT, DS, CD, CA, CS, CO and CB scores with diagnostic status and time elapsed since diagnosing/self-diagnosing and survey participation as independent variable. This variable consisted of four groups, diagnosed less than six years ago, diagnosed six or more years ago, self-diagnosed less than six years ago and self-diagnosed six or more years ago. The results are summarised in Table 6a. There was a statistically significant difference in task performance based on the time elapsed since diagnosis/self-diagnosis and a participant's diagnostic status , F (36, 497) = 1.86, p = .002; Wilk's Λ = 0.688, η_p^2 = .12. Follow up ANOVAs were then conducted on AQ, BDI, BAI, CAT-Q and CB scores. Contrasts were run to test differences between the diagnosed and the self-diagnosed and between those diagnosed/self-diagnosed less than six years ago and those diagnosed/self-diagnosed six or more years ago in AQ, BDI, BAI, CAT-Q and CB scores. Data is presented as mean ± standard deviation.

Table 6a

MANOVA results with time elapsed since diagnosis/self-diagnosis as fixed factor and contrasts.

Variable	*F*	*p*	η_p^2	Contrasts	Cohen's *d* for contrasts
AQ	2.38	.071	.04	DX recently > SDX recently	0.50
				DX = SDX	
				DX/SDX recently = DX/SDX longer ago	
RMIE	1.47	.223	.02		
BDI	3.45	.018	.06	DX recently > DX longer ago	0.51
				DX longer ago < SDX recently	0.79
				SDX recently > SDX longer ago	0.52
				DX < SDX	0.29
				DX/SDX recently > DX/SDX longer ago	0.52
BAI	7.96	.000	.12	DX recently < SDX recently	0.67
				DX longer ago < SDX recently	1.01
				SDX recently > SDX longer ago	0.64
				DX < SDX	0.54
				DX/SDX recently > DX/SDX longer ago	0.48
TAS	0.26	.858	.00		
CAT-Q	7.67	.000	.11	DX recently < SDX recently	0.62
				DX longer ago < SDX recently	1.12
				SDX recently > SDX longer ago	0.74
				DX < SDX	1.00
				DX/SDX recently > DX/SDX longer ago	1.25
DS	0.29	.833	.01		
CD	2.10	.102	.03		
CA	0.24	.866	.00		
CS	1.07	.365	.02		
CO	1.22	.304	.02		
CB	2.42	.068	.04	DX = SDX	
				DX/SDX recently < DX/SDX longer ago	0.41
				DX recently < DX longer ago	0.54
				DX recently < SDX longer ago	0.54

Note. AQ: Autism-Spectrum Quotient; RMIE: Reading the Mind in the Eyes task; BDI: Beck Depression Inventory; BAI: Beck Anxiety Inventory; TAS: Toronto Alexithymia Scale; CAT-Q: Camouflaging Autistic Traits Questionnaire; DS: Digit span task; CD: Childhood depression; CA: Childhood anxiety; CS: Childhood sensitivity; CO: Childhood outgoingness; CB: Childhood behaviour.

A one-way ANOVA was conducted to determine if AQ scores were different for groups with different diagnostic status and recency of diagnosis/self-diagnosis. AQ score was statistically significantly different between different groups, $F(3, 196) = 2.64$, $p = .051$. AQ score increased from the self-diagnosed less than six years ago ($M = 36.36$, $SD = 4.97$) to the diagnosed more than six years ago ($M = 36.78$, $SD = 7.38$), the self-diagnosed six or more years ago ($M = 37.31$, $SD = 5.57$), and diagnosed less than six years ago ($M = 38.97$, $SD = 5.41$) groups. Tukey post hoc analysis

revealed that the mean difference between those that were diagnosed less than six years ago and those that were self-diagnosed less than six years ago (2.61, 95% CI [0.69, 4.53]) was statistically significant (p = .008). No other group differences were statistically significant.

A one-way ANOVA found that the effect of group membership on BDI scores was significant, $F(3,197) = 4.70$, p = .003, $\eta_p^2 = 0.07$. Post hoc analysis identified three significant differences. The diagnosed six or more years ago group, (M = 37.69, SD = 11.74) had significantly lower BDI scores than those who were diagnosed less than six years ago group (M = 43.90, SD = 12.69; 6.21, p = .020, 95% CI [0.99, 11.43]) as well as those self-diagnosed less than six years ago (M = 47.15, SD = 12.35; 9.47, p = .001, 95% CI [4.17, 14.76]). The BDI scores for the self-diagnosed less than six years ago group were also significantly higher than the self-diagnosed six or more years ago group (M = 41.25, SD = 10.07; 5.90, p = .018, 95% CI [1.02, 10.79]). Contrasts revealed that the diagnosed had marginally significantly lower BDI scores than the self-diagnosed, 6.82, p = .062, 95% CI [8.33, 13.97] and those diagnosed or self-diagnosed more recently had significantly higher BDI scores than those diagnosed or self-diagnosed six or more years ago, (12.11, p = .001, 95% CI [4.97, 19.26]).

A one-way ANOVA was conducted to determine if BAI scores were different for groups with different diagnostic status and recency of diagnosis/self-diagnosis. BAI score was statistically significantly different between different groups, $F(3, 197) = 8.92$, p <.001, $\eta_p^2 = 0.12$. BAI score followed a similar pattern to BDI scores, with the self-diagnosed less than six years ago group (M = 50.57, SD = 13.75) being significantly higher than the three other groups. In order of greatest to smallest mean differences, the self-diagnosed recently had higher BAI scores than the diagnosed six or more years ago group (M = 38.12, SD = 10.86; 12.45, p <.0005, 95% CI [6.90, 18.00]), the diagnosed less than six years ago group (M = 41.72, SD = 12.46; 8.85, p <.001, 95% CI [4.58, 13.13]) and the self-diagnosed six or more years ago group (M = 42.38, SD = 11.87; 8.20, p = .002, 95% CI [3.07, 13.32]). Contrasts revealed significant mean differences between the diagnosed and

the self-diagnosed with the latter scoring higher in the BAI (13.11, p = .001, 95% CI [5.62, 20.60]) and between those diagnosed or self-diagnosed less than six years ago and those diagnosed or self-diagnosed longer ago, with the former scoring higher, (11.79, p = .002, 95% CI [4.30, 19.28]).

A Welch one way ANOVA[7] was conducted to investigate the effect of group membership on CAT-Q scores, $F(3,197) = 10.14$, $p < .001$, $\eta_p^2 = .13$. Games-Howell post hoc analysis found three statistically significant differences between groups in CAT-Q score, with the opposite of the pattern found in the BDI and BAI scores. Those who self-diagnosed less than six years ago had significantly higher CAT-Q scores than all other groups. The diagnosed less than six years ago group had a mean difference of 14.60 (SE = 3.90, p <.001), those that had been diagnosed six or more years ago scored an average of 26.51 (SE = 4.87, p <.001) less than the recently self-diagnosed and the self-diagnosed six or more years ago group had a mean difference of 17.57 (SE = 4.84, p = .001). Contrasts identified a significant difference between those who were diagnosed or self-diagnosed less than 6 years ago and those that diagnosed or self-diagnosed six or more years ago, with a difference of 29.48 (SE = 7.19), p <.001. The difference in CAT-Q scores between the diagnosed and the self-diagnosed was also significant, 23.54, p = .001, SE = 7.19.

Group membership, tested with a one-way ANOVA, was also found to have a significant effect on CB scores, $F(3,197) = 3.21$, p = .024, η_p^2 = .05. CB score increased from the diagnosed less than six years ago (M = 2.89, SD = 2.35) to the self-diagnosed less than six years ago (M = 3.46, SD = 2.57), the self-diagnosed six or more years ago (M = 4.19, SD = 2.48) and the diagnosed six or more years ago (M = 4.22, SD = 2.56). Post hoc tests revealed marginally significant differences between the diagnosed less than six years ago group and the self-diagnosed six or more years ago group (1.30, p = .011, 95% CI [0.31, 2.29]) and the diagnosed six or more years ago group (1.33, p = .016, 95% CI [0.26, 2.41]). Contrasts found the difference between those diagnosed or self-diagnosed less than six years ago and those diagnosed or self-diagnosed longer ago, significant, -2.05 (p =

[7] due to significant Levene's test of Homogeneity, p = .037

.007, 95% CI [-3.53, -0.58]). The difference in CB scores between the diagnosed and the self-diagnosed was not significant, p = .473.

Appendix E

Supplementary findings

Studies 1a and 1b

Given the significant difference between diagnosed and self-diagnosed participants in autistic traits in Studies 1a and 1b, a hierarchical regression was conducted on the age of diagnosis only. CD, CA, CS, CO and CB were entered into the first model, which was significant, $F(5,89) = 3.36$, $p = .008$. These five variables predicted 15.9% of the variance in age of diagnosis. The second model added the seven main variables, AQ, RMIE, BDI, BAI, TAS, CAT-Q and DS, which was a non-significant change, $F(7,82) = 1.61$, $p = .145$. The second model was significant, explaining 26% of the variance, $F(12.82) = 2.41$, $p = .010$.

Study 2

All five predictors were entered simultaneously in a multiple analysis, with age of diagnosis as the DV. This resulted in a non-significant model, $F(5,113) = 1.68$, $p = .145$.