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Depressive symptoms in autistic young adults: the complex relationship with perceived social support and practical and social adaptive functioning

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Introduction

Comorbidities with other mental conditions are widely recognised as a common struggle among individuals diagnosed with Autism Spectrum Disorder (ASD). In particular, internalising symptoms, and especially depression, are considerably more prevalent among autistic people compared with the general population. However, existing literature has predominantly focused on children and adolescents, while overlooking other age groups. Until a few decades ago, ASD was indeed conceptualised primarily as a childhood condition, despite its lifelong nature.

In the context of this discussion, it is important to note that early adulthood may represent a particularly vulnerable period for autistic individuals: the transition from adolescence to adult life is often accompanied by changes in educational and support systems, potentially impacting resource access. Moreover, young adulthood is characterised by increased expectations regarding autonomy, employment, daily living skills and interpersonal relationships, potentially heightening existing social, adaptive and psychological challenges in autistic individuals.

Although literature focusing specifically on the young adult population is limited and results are mixed, factors that have been explored in association with depressive symptoms in ASD include adaptive functioning and perceived social support. As broadly supported by research in the general population, perceived social support can indeed play an important role in the mental wellbeing of individuals, buffering loneliness and providing emotional resources. Similarly, adaptive functioning was found to be related to psychopathology by influencing the abilities to cope with everyday demands and to maintain independence. However, literature on these associations in the autistic adult and young adult population remains scarce. For this reason, the current study aims to address the literature gap regarding depressive symptoms in autistic young adults by analysing associations between different measures of depression, administered both to participants and to their parents, and adaptive functioning and perceived social support in a sample of autistic young adults, including individuals with or without mild intellectual disability.

To achieve this aim, the dissertation is structured into five chapters. The first chapter introduces ASD, outlining its diagnostic criteria, prevalence, associated features, aetiology and developmental trajectories, with a specific focus on autism in young adulthood. The second chapter focuses on depression in autistic individuals, presenting

its definition and prevalence, with particular attention to young adults, and reviewing possible mechanisms and risk factors. Within the same chapter, perceived social support and adaptive behaviour are also discussed as relevant factors potentially associated with depressive symptoms and psychological wellbeing. The third chapter describes the research project, including its aims, methodology, participants, instruments and procedure. The fourth chapter presents the results, including descriptive analyses of the screening and experimental measures, followed by correlation analyses examining the relationships between depression, perceived social support, adaptive behaviour, together with cross-informant associations in depression ratings. The fifth and final chapter discusses the findings in relation to the existing literature, considers the study's limitations, proposes future research directions and summarises the main conclusions.

Chapter 1

Autism Spectrum Disorder

According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), ASD is a neurodevelopmental disorder, characterised by deficits in two broad domains, the one of communication and social interaction, also defined as the socio-communicative area, and the one related to restricted or repetitive activities or interests (American Psychiatric Association [APA], 2022). These two areas are central to the assessment and diagnosis of ASD, underpinning the diagnostic criteria of the condition.

The prevalence of autism on a global scale, also taking into account geographical regions, gender, socioeconomic status, and ethnicity, has been assessed by several studies and has shown a consistent increase in diagnoses in the last few decades (Salari et al., 2022; Zeidan et al., 2022). However, estimates change consistently according to a number of aspects (Elsabbagh et al., 2012; Talantseva et al., 2023).

The aetiology of ASD is complex, with multiple factors, both genetic and environmental, believed to be contributing (M. Wang et al., 2025). Numerous explanations have been proposed over time, and distinct interpretative theories complement each other to explain different aspects of the condition. Importantly, neurodevelopmental disorders manifest in the early phases of an individual's development (APA, 2022) and, even though they interact with developmental trajectories, experiences, context, and the stimulation an individual receives, they arise from underlying neurobiological mechanisms (Ismail & Shapiro, 2019).

ASD can be identified as early as before two years of age (APA, 2022), but diagnosis may occur later if external demands do not exceed an individual's abilities (Daniels & Mandell, 2014). This is possible because autism is a spectrum, ranging from subtle to strongly pronounced difficulties in the previously mentioned areas (APA, 2022). Regardless of when diagnosed, autism persists across the lifespan (Z. Wang & Mosconi, 2023), making it essential to address the difficulties and needs of autistic people in adulthood as much as in earlier stages.

1.1. Diagnostic criteria

The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5) diagnostic criteria of ASD are the aspects to be observed within the social-communicative area and the area related to restricted or repetitive activities or interests, helping define individual strengths and challenges. They include:

A. "Persistent deficits in social communication and social interaction across multiple contexts, as manifested by the following, currently or by history (examples are illustrative, not exhaustive; see text):
    1. Deficits in social-emotional reciprocity, ranging, for example, from abnormal social approach and failure of normal back-and-forth conversation; to reduced sharing of interests, emotions, or affect; to failure to initiate or respond to social interactions.
    2. Deficits in nonverbal communicative behaviours used for social interaction, ranging, for example, from poorly integrated verbal and nonverbal communication; to abnormalities in eye contact and body language or deficits in understanding and use of gestures: to a total lack of facial expressions and nonverbal communication.
    3. Deficits in developing, maintaining, and understanding relationships, ranging, for example, from difficulties adjusting behaviour to suit various social contexts; to difficulties in sharing imaginative play or in making friends; to absence of interest in peers.
B. Restricted, repetitive patterns of behaviour, interests, or activities, as manifested by at least two of the following, currently or by history (examples are illustrative, not exhaustive; see text):
    1. Stereotyped or repetitive motor movements, use of objects, or speech (e.g., simple motor stereotypies, lining up toys or flipping objects, echolalia, idiosyncratic phrases).
    2. Insistence on sameness, inflexible adherence to routines, or ritualized patterns of verbal or nonverbal behaviour (e.g., extreme distress at small changes, difficulties with transitions, rigid thinking patterns, greeting rituals, need to take same route or eat same food every day).

3. Highly restricted, fixated interests that are abnormal in intensity or focus (e.g., strong attachment to or preoccupation with unusual objects, excessively circumscribed or perseverative interests).
4. Hyper- or hyporeactivity to sensory input or unusual interest in sensory aspects of the environment (e.g., apparent indifference to pain/temperature, adverse response to specific sounds or textures, excessive smelling or touching of objects, visual fascination with lights or movement).

C. Symptoms must be present in the early developmental period (but may not become fully manifest until social demands exceed limited capacities, or may be masked by learned strategies in later life).

D. Symptoms cause clinically significant impairment in social, occupational, or other important areas of current functioning.

E. These disturbances are not better explained by intellectual disability (intellectual developmental disorder) or global developmental delay. Intellectual disability and autism spectrum disorder frequently co-occur; to make comorbid diagnoses of autism spectrum disorder and intellectual disability, social communication should be below that expected for general developmental level" (APA, 2022, pp. 50-51).

Along with these characteristics, to diagnose ASD, the determination of a level of severity is also expected. This should be done separately for impairments on social communication and for restricted, repetitive patterns of behaviour, and according to the amount of support needed by the individual to properly function in their environment. Specifically, the levels are three:

- "Level 1: Requiring support.
    - "Without supports in place, deficits in social communication cause noticeable impairments. Difficulty initiating social interactions, and clear examples of atypical or unsuccessful responses to social overtures of others. May appear to have decreased interest in social interactions. For example, a person who is able to speak in full sentences and engages in communication but whose to-and-fro conversation with others fails, and whose attempts to make friends are odd and typically unsuccessful.

    - Inflexibility of behaviour causes significant interference with functioning in one or more contexts. Difficulty switching between activities. Problems of organization and planning hamper independence.
- Level 2: Requiring substantial support.
    - Marked deficits in verbal and nonverbal social communication skills; social impairments apparent even with supports in place; limited initiation of social interactions; and reduced or abnormal responses to social overtures from others. For example, a person who speaks simple sentences, whose interaction is limited to narrow special interests, and who has markedly odd nonverbal communication.
    - Inflexibility of behaviour, difficulty coping with change, or other restricted/ repetitive behaviours appear frequently enough to be obvious to the casual observer and interfere with functioning in a variety of contexts. Distress and/or difficulty changing focus or action.
- Level 3: Requiring very substantial support
    - Severe deficits in verbal and nonverbal social communication skills cause severe impairments in functioning, very limited initiation of social interactions, and minimal response to social overtures from others. For example, a person with few words of intelligible speech who rarely initiates interaction and, when he or she does, makes unusual approaches to meet needs only and responds to only very direct social approaches.
    - Inflexibility of behaviour, extreme difficulty coping with change, or other restricted/ repetitive behaviours markedly interfere with functioning in all spheres. Great distress/difficulty changing focus or action" (APA, 2022, p. 52).

Additionally, it is necessary to specify if the condition is observed "with or without accompanying intellectual impairment" and "with or without accompanying language impairment", and whether it is associated "with a known medical or genetic condition or environmental factor" or "with another neurodevelopmental, mental, or behavioural disorder" (APA, 2022, p. 51).

The International Statistical Classification of Diseases and Related Health Problems, Eleventh Revision (ICD-11; World Health Organization, 2019) also structures the

proposal of diagnosis with two areas of deficit and relative specifiers, therefore aligning with DSM-5 diagnostic framework.

Regarding the age of onset, the DSM-5 specifies that symptoms are typically recognised between 12 and 24 months of age, but may appear earlier if developmental delays are severe, or later if symptoms are more subtle (APA, 2022).

1.2. Prevalence of the condition and associated characteristics

1.2.1. Epidemiology, prevalence and influencing factors

Recent systematic reviews estimate the prevalence of ASD to be of about 1 child out of 100, with a considerable increase worldwide (Salari et al., 2022; Talantseva et al., 2023; Zeidan et al., 2022). A meta-analysis by Zeidan et al., (2022) identified factors that could influence diagnosis and, therefore, prevalence trends, including "community awareness and public health response globally, changes in case definition that have broadened diagnostic boundaries over time, increased diagnosis of milder forms, and increase in the identification of autism in previously under-diagnosed populations defined by sex, geography, ethnicity or socioeconomic status" (Zeidan et al., 2022, p.786).

Another important factor is the male-to-female ratio, which is highly skewed, to the point that there is about one diagnosed female per 4 males (Loomes et al., 2017).

Moreover, intellectual disability co-occurs in roughly 33% of ASD cases (Zeidan et al., 2022), though this estimate is highly variable, depending on assessment tools and population, and is gradually decreasing compared to earlier estimates (Lord et al., 2018; Shenouda et al., 2023).

For this reason, and for the reasons mentioned above, it is important to examine the factors that influence prevalence estimates.

To begin with, as mentioned, biological sex is an important influencing factor. Although males may exhibit greater neurobiological susceptibility, the highly skewed male-to-female ratio probably indicates that many females go undiagnosed, rather than suggesting a genuinely lower prevalence of autism (Hodge et al., 2025; Young et al., 2018). The underdiagnosis of females could be explained by the fact that the instruments and criteria of diagnosis are mostly developed and validated on male samples and therefore more sensitive to male autism and less discriminative of female clinical presentation (Belcher et al., 2023; Minutoli et al., 2026; Wood-Downie et al., 2021). Moreover, much about

female manifestations of autism, which may differ from those observed in males, still eludes our understanding. In fact, females are known to frequently employ camouflaging techniques and compensatory behaviours to conceal their difficulties, which may help explain the underdiagnosis of autism in this group (Lai et al., 2017; Rynkiewicz et al., 2016; Wood-Downie et al., 2021). These techniques may facilitate social adaptation in the short-term, but, in the long run, the use of compensatory strategies may result in psychological and emotional strain, with stress and exhaustion accumulating as a result of the constant effort to manage symptoms and adapt to external demands (Cage et al., 2018; Cassidy et al., 2018). These aspects are, however, poorly explored, due to research struggles in gathering data about autistic females, since female diagnosis rate and level of severity is still low compared to males' (Bargiela et al., 2016; D'Mello et al., 2022).

Another factor that can influence diagnosis, and therefore global prevalence estimates, is socioeconomic status. For example, in higher-income countries, the prevalence of ASD appears higher compared to lower-income countries. This may reflect, rather than true prevalence differences, underdiagnosis and limited data availability, or reduced capacity of countries to meet mental health demands (Yang et al., 2023). Moreover, higher income has been associated with higher autism rates within some countries, but not in others. The origins of this figure remain to be further explored and cannot be attributed solely to differences in access to care, given the divergent trends observed in different countries (Elsabbagh et al., 2012).

A tightly related aspect is that of ethnicity. Although this matter remains underexplored, research has shown that in some countries, particularly the United States, underdiagnosis is observed among minority ethnic groups, potentially reflecting cultural, linguistic or socioeconomic barriers that are likely affecting access to care (Imm et al., 2019; Jariwala-Parikh et al., 2019; Zeidan et al., 2022).

To socioeconomic status and ethnicity is connected the matter of geographic region: a rise in ASD diagnosis in regions that were once underrepresented, like Africa and Middle-East, is being observed. This could mean awareness about this kind of conditions is gradually starting to rise in these regions, along with access to mental health services and promotion of primary care (Ebrahimi et al., 2023).

Overall, the evidence reviewed in the present paragraph highlights that prevalence estimates reflect not only true occurrence, but also, and perhaps more importantly, the

demographic and contextual factors which influence diagnosis. However, in order to capture the complexity autism, it is crucial to consider that clinical presentation and outcomes are also influenced by a wide range of conditions that commonly co-occur with it.

1.2.2. Comorbidity in Autism Spectrum Disorder

Comorbidity in ASD is related to both its global prevalence estimates and patterns of diagnosis and reflects the clinical complexity of the condition.

In fact, comorbidity is highly common among autistic people, often involving the manifestation of multiple neurodevelopmental conditions. In this field, a dimensional - rather than purely categorical - approach to diagnosis is adopted, highlighting a probable underlying neurobiological vulnerability that could contribute to the development of multiple conditions (Licari et al., 2019).

Most notably, ASD is comorbid with Attention Deficit Hyperactivity Disorder in about 30% of cases or more, according to some studies (Al-Beltagi, 2021; Khachadourian et al., 2023; Stevens et al., 2016).

Internalising symptoms are also common in autistic individuals, with approximately 40% of cases presenting anxiety or mood disorders, or reaching even higher rates depending on methods and populations studied (Hollocks et al., 2019; Postorino et al., 2017).

Additionally, eating disorders and sleep-related disorders can co-occur with ASD. The former are indeed reported in up to 80% of cases (Almohmadi, 2024), while the latter are observed in about 50% of cases, particularly involving difficulties in initiating and maintaining sleep, frequent nighttime awakenings, reduced total sleep duration, and fragmented sleep patterns (Cortese et al., 2020; Galli et al., 2022).

In some cases of ASD, Obsessive Compulsive Disorder can also be observed, although it is important to differentiate it from the repetitive behaviours characteristic of autism that are not associated to obsessions (Aymerich et al., 2024; Postorino et al., 2017). Tics and Tourette's syndrome can also be present, in a minority of autistic individuals (Canitano & Vivanti, 2007). Finally, notably, ASD is also related to high levels of irritability and both hetero- and auto-aggressivity (Hill et al., 2014).

To sum up, comorbid conditions may arise at different developmental stages and significantly impact quality of life. Early and appropriate support is therefore essential to

improve quality of life and prevent difficulties associated with secondary psychopathology later in life (Mannion et al., 2014).

1.3. Aetiology and interpretative models

1.3.1. From historical misconceptions to contemporary genetic evidence

The aetiology of ASD is complex and multifactorial, involving genetic, neurobiological, neurophysiological and neuroanatomical factors, which make it difficult to identify specific causal mechanisms underlying its development.

Today, certain previously proposed and once widely accepted hypotheses, such as the "refrigerator mother" hypothesis and the vaccines hypothesis, have been definitively rejected. The former, initially suggested by Leo Kanner and subsequently popularised by Bruno Bettleheim's book, The Empty Fortress (Bettelheim, 1967), attributed autism in the child to a dysfunctional relationship with the mother, apparently cold and unable to express the warmth and sense of security necessary for the development of a healthy relationship. This explanation was later rejected as it was proven that, while relationships with caregivers can have an impact on the healthy development of children, the cause of ASD is not fundamentally relational, but has neurobiological bases (Jackman & Zwaigenbaum, 2023).

The link between autism and vaccines, on the other hand, originated from scientific fraud, and, more specifically, a study that associated the higher prevalence of ASD to the introduction of the Measles, Mumps, and Rubella (MMR) vaccine. This article was later disconfirmed and the author removed from the medical register after undisclosed conflicts of interests were discovered, since, in particular, he was paid to carry out the research by lawyers seeking anti-MMR evidence (Rodriguez, 2024).

Having rejected these historical misconceptions, ASD is now considered a substantially heritable condition, with twin and familial heritability ranging from 60 to 90% (Tick et al., 2016). However, it is important to recognise that a wide range of environmental factors, such as increased parental age, maternal complications or infections during pregnancy, and perinatal factors, also play a role in shaping risk (Rylaarsdam & Guemez-Gamboa, 2019).

Strengthening the argument for a genetic aetiology, ASD is also associated to certain genetic conditions, such as Fragile X syndrome, Cohen's syndrome, tuberous sclerosis,

Rett's syndrome and Phenylketonuria (Richards et al., 2015). Moreover, it is known that, in families with an autistic child, the probability that a subsequent child will be autistic increases to approximately 6-10%, compared to the 1% probability in the general population (Bailey et al., 1998). Although reported estimates vary substantially, a number of twin studies have demonstrated that the concordance rate for the condition in monozygotic twins is generally much higher than in dizygotic twins, supporting a strong genetic contribution in ASD aetiology (Tick et al., 2016).

However, it is important to note that around 75–80% of individuals with ASD do not present an identifiable single-gene mutation or copy number variant, emphasising the importance of multifactorial and non-genetic influences in its aetiology (M. Wang et al., 2025). Large-scale genomic analyses have indeed shown that autism is highly polygenic, meaning that thousands of common genetic variants of individually small effects collectively contribute to liability to the condition (Havdahl et al., 2021). In the last few decades, advanced sequencing technology has confirmed that the aetiology of ASD is characterised by multiple genetic contributors and substantial heterogeneity, with few pathogenic variants shared across a large proportion of affected individuals (Rylaarsdam & Guemez-Gamboa, 2019). Mutations that are believed to be contributing to typical ASD cannot indeed be said to cause the condition, but only to incrementally enhance susceptibility to the disease. In fact, both genetic and non-genetic factors modulate the penetrance of risk genes, resulting in a highly heterogeneous disease phenotype for similar pathogenic variants (Ghafouri-Fard et al., 2023).

Nevertheless, dozens of large-scale genetic studies have led to hundreds of autism risk genes being identified (Rylaarsdam & Guemez-Gamboa, 2019), the majority of them encoding for two broad classes of proteins: those involved in synapse formation, and those involved in transcriptional regulation and chromatin-remodelling pathways (De Rubeis et al., 2014).

1.3.2. Neurobiological factors and environmental influences

Neurobiological factors, many of which are thought to arise from the genetic mechanisms described above, have also been implicated in the aetiology of ASD. Evidence for their involvement comes from the high co-occurrence of autism with Intellectual Disability and other conditions involving the Central Nervous System, such as epilepsy, present in

approximately 20% of cases, suggesting shared disruptions in neural mechanisms (Besag, 2017; Pan et al., 2021). Furthermore, the higher prevalence of the condition among biological males may be an indicator of sex-linked biological factors being involved (Lai et al., 2013).

Neurobiologically, it is important to note that autism is now seen as a reorganisation of the whole architecture of the brain, starting early in development, rather than impairments in focalised brain regions (Lord et al., 2018).

Notably, atypia in indices of neurophysiological functioning has also been observed. For example, alterations in electroencephalography tracing, associated with the areas of deficits characterising ASD, have been found by several studies (Bosetti et al., 2024). Additionally, deficits in social interactions have been proposed to be associated with impaired functioning in the mirror neuron system in the brain, active during the execution and observation of actions and implicated in imitation, empathy and social cognition. However, this explanation remains debated, and empirical findings are mixed and do not provide conclusive support (Salimova, 2022).

Neuroanatomically, brain growth in autistic individuals tends to follow a different trajectory compared to the general population. Specifically, an atypically rapid growth rate is usually observed from the first year of life, resulting in an increase in brain volume of approximately 5-10%, until about the fourth year of life. This period is followed by a deceleration in development, such that brain volume in late adolescence and adulthood appears comparable to that of neurotypical individuals (Courchesne et al., 2011; Donovan & Basson, 2017). Despite similar outcomes later in life, the developmental trajectory itself is markedly different in autistic individuals and characterised by sharp peaks and falls. These patterns have been linked to atypical connectivity and imbalance between excitation and inhibition due to abnormal neural proliferation and pruning (Liu et al., 2025).

However, a growing body of research has also highlighted how environmental factors may affect susceptibility to ASD, possibly interacting with biological vulnerability factors. For example, prenatal factors may represent important risk factors: according to a meta-analysis by Dehesh et al., (2024), the risk of developing ASD in children of older fathers seems to be 1.5 times higher than that of children of younger fathers. High age of mothers was also found to be associated with greater risk of developing the condition

although this relationship may be shaped by underlying factors rather than reflecting a direct effect.

Historically, maternal viral infections during pregnancy, and particularly Rubella and Cytomegalovirus, have been associated with an increased risk of autism (Patterson, 2009). However, while prenatal infection and maternal inflammation are recognised as important risk factors, findings across studies are not entirely consistent, and current research suggests that the maternal immune response, rather than specific infections alone, may play a central role (Woods et al., 2023).

Finally, perinatal conditions, such as low birth weight, being small for gestational age and neonatal hypoxia, have also been shown to be potential risk factors associated to the development of ASD (Gardener et al., 2011).

Overall, this evidence suggests that genetic, neurobiological and environmental factors may all play a role in the aetiology of ASD, interacting throughout development to shape individual vulnerability and contributing to the heterogeneity of presentations observed across autistic individuals.

1.3.3. Main theoretical models of Autism Spectrum Disorder

Apart from aetiology research, different models explaining the characteristics of ASD have been proposed. As a matter of fact, there is no unique, integral theory encompassing and thoroughly explaining all the characteristics of the condition, but, classically, three main models explain different aspects of autism and can be used in a combined and complementary way.

Firstly, the Theory of Mind explanation proposed by Baron-Cohen et al. (1985), states that autistic individuals may have a reduced ability to comprehend and predict mental states, including thoughts, wishes and intentions, both in themselves and others, consequently impacting their functioning. Specifically, this impairment can explain deficits on the areas of social and communicative functioning.

Secondly, difficulties in autistic individuals may arise from deficits in executive functions, such as working memory, inhibitory control, cognitive flexibility, and self-monitoring. This explanation is suggested by the Theory of Executive Functions (Pennington & Ozonoff, 1996), which proposes that a core vulnerability in executive processes may, in turn, affect other areas of functioning, particularly adaptation, cognitive

flexibility, attention regulation, and self-regulation. This theory is especially effective in explaining difficulties in the area of restricted activities and interests, as the previously mentioned impairments may underlie repetitive behaviours and restricted patterns of interest.

Finally, the Theory of Central Coherence (Frith, 1996) highlights how the functioning of autistic individuals is characterised, as the name suggests, by weak central coherence and a tendency towards local processing of stimuli. This means that autistic individuals tend to focus on specific aspects and details of perception and have difficulties integrating them into a coherent whole, and therefore in processing the global stimulus, regardless of the modality of presentation (e.g.; visual information or stimuli related to everyday life, including language and communication). This may result in problems in grasping meaning, especially when ambiguous, and in using contextual information. This model can explain deficits in both the socio-communicative domain and the area of restricted activities and interests.

1.4. Developmental trajectories: autism in young adults

As already addressed, ASD is a neurodevelopmental disorder that emerges in the first years of life and impacts the development of the affected children on many different areas of functioning. However, it is crucial to note that Neurodevelopmental Disorders persist across the lifespan of individuals and are lifelong conditions, from which one cannot be "cured" in the traditional sense of the word, as they are not illnesses (Z. Wang & Mosconi, 2023).

ASD can exhibit heterogeneous trajectories in adulthood, leading to different types of difficulties for each person and, importantly, its manifestation can change over time in what is called "chronogeneity", whereby childhood autistic traits evolve and vary in expression over the course of development (Fountain et al., 2023). However, unfortunately, research on the matter remains scarce and, while many studies have explored the causes and early emergence of the condition, only a few large-sample longitudinal studies have focused on its progression and change over time. Addressing these gaps, especially in early adulthood, could help better understand the factors that influence the lives of autistic people, to be able to offer resources and interventions targeting difficulties in everyday life, wellbeing, and inclusion.

One example is the longitudinal study by Fountain et al., (2023), following many autistic people in California, US, for a period of 24 years, and assessing developmental trajectories of autistic traits, specifically in the areas of communication and social functioning. The results of this study highlight the extremely heterogenous nature of autism developmental trajectories, defining six different patterns for communication and seven for social functioning. The majority of people tends to show improvements in communication skills while growing up, which then slow down after adolescence. On the other hand, social functioning seems to be more stable, with many autistic individuals showing little and uneven change in social skills. The authors also stressed how socioeconomic factors likely play a central role in influencing trajectory differences, with people having higher socioeconomic status more likely to show improvement in both areas, suggesting access to resources and services plays a major role. Racial and demographic disparities also exist, with children of white and higher socioeconomic status mothers more likely to show improvement, and children of minority or immigrant backgrounds more likely to have less favourable developmental trajectories. Again, this could reflect differences in access to care, systemic inequality and possible diagnostic biases.

Regarding the severity of core autism characteristics, a systematic review by Hiralal et al. (2025), also found evidence for multiple trajectories of symptoms, but with some degree of stability regarding overall severity. Generally, they found that most individuals seem to show increasing severity in repetitive behaviours, interests, and activities. As for adaptive behaviour and behavioural problems, they observed that some people are low but stable throughout their life, while others improve.

In this context, it is extremely important to keep in mind how developmental trajectories for autistic individuals are non-linear and do not necessarily constitute a simple pattern of improvement or decline. In fact, some subgroups deviate from expected trajectory, including individuals with late-emerging symptoms, reinforcing how autistic development is dynamic, heterogeneous, and non-monotonic (Hiralal et al., 2025).

By other studies, engagement in independent vocational activities was found to be stable over time and linked to greater subjective wellbeing in autistic adults (Clarke et al., 2021), and psychiatric symptoms were found to tend to decline in adulthood, but with varying trajectories and family factors shaping the outcomes (Woodman et al., 2016). Finally,

maladaptive behaviours show mixed trajectories: hyperactivity improves most in adulthood, while social withdrawal often worsens (Anderson et al., 2011).

The transition of autistic adolescents to young adulthood is accompanied by changes in the healthcare support systems available for them and loss of educational services, creating obstacles to resource access at a critical time. A number of studies indeed indicate that this transition is poorly supported and inadequate, with a lack of trained professionals for autism-specific needs, a major gap between service needs and available support, and poor coordination between different systems for service (Malik-Soni et al., 2022; Shattuck et al., 2012). Additionally, stigma and uncertainty discourage help-seeking and worsen the outcomes of adulthood for autistic people. This leads to reduced service use in young adulthood by autistic people and in families often carrying the burden (Malik-Soni et al., 2022; Shattuck et al., 2012). It is crucial to understand how these changes might co-occur with changes in the trajectories of traits mentioned above. Generally, many young autistic individuals indeed encounter challenges once they enter adulthood, particularly because of low engagement in vocational activities (Clarke et al., 2021; Taylor et al., 2014), limited social connectedness (Liptak et al., 2011; Orsmond et al., 2013), and difficulty living independently (Bishop-Fitzpatrick et al., 2016; Shattuck et al., 2012).

In sum, improving the support individuals receive during this delicate period of transition to adulthood is essential to address the diverse developmental trajectories and to promote more positive outcomes in autonomy, adaptive functioning, quality of life and overall wellbeing. These challenges may also have important implications for mental health. Reduced access to support, difficulties in social participation and increased expectations regarding autonomy may contribute to psychological vulnerability during young adulthood. For this reason, the following chapter will focus specifically on depression in autistic individuals and on the potential role of perceived social support and adaptive behaviour.

Chapter 2

Depression, perceived social support and adaptive behaviour in autistic young adults

2.1. The burden of depression among the autistic population

2.1.1. Depression: definition and characterisation

Depression is defined as a mood disorder, as it is characterised by a persistent sad, empty or irritable mood, along with loss of interest and motivation and other somatic and cognitive impairments, such as sleep and appetite alterations, affecting the individual's capacity to function (APA, 2022). According to the DSM-5 (APA, 2022), different depressive disorders can be identified based on duration, timing and presumed aetiology. The criteria for the diagnosis of major depressive disorder include discrete episodes with symptoms lasting at least 2 weeks, involving changes in affect, cognition, and neurovegetative functions, with possible periods of remission between episodes. Moreover, it is important to carefully distinguish between regular sadness or grief and a major depressive episode.

When depression presents itself in a chronic form, with mood disturbances continuing for at least 2 years, it is possible to diagnose dysthymia, or persistent depressive disorder.

For the diagnosis to be confirmed, the observed depressive symptoms of these two conditions must have a significant impact on social, occupational, and other important areas of functioning. Moreover, symptoms should not be derived from other substances or medical conditions.

2.1.2. Prevalence of depression in Autism Spectrum Disorder

Compared with the general population, people diagnosed with ASD tend to be at higher risk of developing comorbid psychopathology. This is supported by literature focusing on the autistic paediatric population (Mutluer et al., 2022), with estimates that exceed those of the general population and comparable subpopulations, such as that of individuals with Intellectual Disability (Mayes et al., 2011). However, increased emphasis has recently been directed towards the exploration of issues like depression in autistic adults. A growing body of research indicates that adults with a diagnosis of ASD are at heightened risk of developing mental health conditions which could exacerbate autistic symptomatology and negatively impact the quality of adult life. In particular,

literature suggests that depression commonly co-occurs with ASD in this developmental stage, with a high burden of depressive symptomatology in autistic adults (Wigham et al., 2017). However, estimates are highly variable, with rates ranging between 70% and as low as less than 1% (Hollocks et al., 2019). In this regard, it is important to highlight the variability in diagnostic assessments of ASD, the significant lack of measures validated for assessing mental health comorbidities in adult ASD populations (Cassidy et al., 2018), and the scarcity of studies focusing on presentations of depression in autistic adults (Hollocks et al., 2019). Additionally, there is a great variance in methods used in studies on this matter, with, for example, some using population-based samples, while others using convenience sample estimates, or some using self-report, while others caregiver-report measures of depressive symptoms (Pezzimenti et al., 2019). These factors together contribute to the high heterogeneity of the populations being taken into account in different studies, making it challenging to establish accurate and reliable prevalence rates of depression in autistic adults and partially explaining variability in reported depression rates in this population.

Nevertheless, studies in clinical settings, based on autistic adults seeking treatment, report higher rates of depression, ranging between 20 and 35% (Gotham et al., 2015; Mazefsky et al., 2008), compared to the general population, which shows rates around 7% (Kessler et al., 2003).

A recent population-based study with a relatively large sample of adults diagnosed with ASD reported a 25% prevalence of depression, representing a twofold higher risk of depression in ASD compared to the general population (Croen et al., 2015). Similarly, a systematic review and meta-analysis by Hollocks et al., (2019) found a current prevalence of 23% and a lifetime prevalence of 37% for adults with an ASD diagnosis. These findings may suggest significant mood-related difficulties for this specific population and perhaps a developmental progression, with depression gaining prominence as individuals grow up and enter adulthood. This is in contrast with findings from studies on autistic children, which report that depressive features appear to improve with age (Woodman et al., 2016).

Additionally, findings by Hollocks et al., (2019), highlighted a difference in prevalence between those with Intellectual Disability and those without: the former showed a prevalence 10% lower than the latter. This possibly suggests that having greater cognitive

abilities, and therefore greater awareness of one's own symptoms and difficulties, may result in being more prone to depression (Sterling et al., 2008). However, greater rates of depression in autistic individuals without intellectual disability may also reflect inadequate measures for assessing depressive symptoms in ASD. Self-report measures may indeed have lower sensitivity to presentations of depression in autistic individuals who have an intellectual disability and therefore heightened difficulties in identifying and describing internal states, including the physiological, emotional, cognitive and behavioural experiences of depression (Hassiotis & Turk, 2012).

In line with the findings by Hollocks et al., (2019), a recent meta-analysis (Pezzimenti et al., 2019) found that people with an ASD diagnosis tend to show higher rates of depression as they get older, with rates of 40.2% in adult samples compared to 7.7% in samples of people aged 18 years and below. Additionally, higher rates of depression have been found by the same study in autistic individuals with average to above average IQ, with a rate of 52.8% compared to 12.2% in individuals whose IQ was below average. Overall, the findings by Hollocks et al., (2019) highlight that autistic individuals are approximately four times more likely to experience depression compared to the general population.

2.1.3. Depression in autistic young adults

Autistic individuals may go through a particularly vulnerable period during the transition from adolescence to adulthood. This phase is indeed characterised by significant adjustment, with new challenges related to changes in support systems and resource access, which may exacerbate any potential comorbidity (Crane et al., 2019).

A study that collected information on depressive symptoms and diagnosis from 315 young adults on the Autism Spectrum (Zheng et al., 2021) reported that they experienced several barriers to accessing treatment for depression, including financial issues, accessibility to appropriate care, and lack of understanding by professionals about depression in autism, all of which are in line with other findings about autistic adults frequently reporting barriers to accessing care (Camm-Crosbie et al., 2019). Combining results of well-validated measures of current depressive symptoms and previous diagnoses, the study then found a current depression rate of 47% and a lifetime rate of 65%. Additionally, a large population-based cohort study including comparison between

siblings with and without an ASD diagnosis followed up between the ages of 18 and 27 years found that 19.8% of autistic individuals had received a diagnosis of depression compared with 6% of the population without a diagnosis of ASD (Rai et al., 2018). Once again, this study found associations with depression to be stronger in autistic individuals without Intellectual Disability. Similarly, another comparison study, by Capp et al., (2025), with a sample of 556 young-adult twins, found that high levels of autistic traits were associated with higher self-reported symptoms of depression and likelihood of fulfilling diagnostic criteria for a low mood disorder.

These findings suggest that young adulthood may represent a particularly relevant period for investigating factors associated with depressive symptoms in autistic individuals, including perceived social support and adaptive functioning.

2.1.4. Potential mechanisms and risk factors

Mechanisms behind the higher prevalence rates of depression among autistic individuals are still unclear, with different hypotheses being advanced but not yet supported by enough data. One of these proposes the possibility of a shared genetic vulnerability between ASD and psychiatric comorbidities, similarly to the common genetic architecture hypothesised among different psychiatric conditions (Cross-Disorder Group of the Psychiatric Genomics Consortium, 2013). In fact, autism and depression both have a heritable component. Autistic children with co-occurring depression are more likely to have a family history of depression (Jokiranta et al., 2013), and, in general, there is a higher prevalence of mood disorders, not apparently accounted for by the stress of raising a child with autism, among close relatives of autistic people (Jokiranta-Olkoniemi et al., 2016). Even though common genetic vulnerability cannot be ruled out and some shared risk loci between autism and other psychiatric conditions have been identified, the Cross-Disorder Group of the Psychiatric Genomics Consortium did not find strong evidence to support the hypothesis of a strong common genetic architecture among these conditions.

Research on the topic has also identified other individual, social and environmental factors of vulnerability associated with the development of depressive symptoms in autistic individuals. These include negative life experiences, peer rejection and social isolation. Moreover, the consistent finding that higher functioning individuals may be at greater risk for depression, together with evidence that better social abilities are also

associated with this comorbidity (Sterling et al., 2008), may suggest that having greater social awareness could increase recognition of one's social difficulties, differences from peers and failures in social interactions (Hedley & Young, 2006). In turn, this may contribute to psychological distress due to low self-esteem, frustration and discouragement. Individual differences in cognitive style and social desire could also play a role: negative attributional patterns, self-blame in social situations, and the desire for social relationships while lacking the necessary skills to create and maintain them may further impair psychosocial adjustment and worsen depressive symptoms (Meyer et al., 2006; Sterling et al., 2008). Therefore, heightened social awareness and repeated negative social experiences may be important risk factors for the development of comorbidities like depression in autistic individuals.

Despite not being able to identify its exact mechanisms, emphasis should be placed on the co-occurrence of depression in autistic individuals, to better understand its impact. Depression may indeed exacerbate the core features of ASD (Sterling et al., 2008), leading to additional disability, reduced social functioning and further challenges in accessing care (Rai et al., 2018). This may be especially pronounced for young adults on the spectrum, who, as already highlighted, encounter significant stress in the transition to adulthood, characterised by misinformation, limited opportunities, insufficient resources and inappropriate services (Malik-Soni et al., 2022; Shattuck et al., 2012). Moreover, depression is recognised as a risk factor for suicide in high-functioning autistic individuals (Culpin et al., 2018), which is a potentially relevant cause of premature mortality among this population (Hirvikoski et al., 2016).

In conclusion, current literature consistently reports depression as one of the most common and clinically significant comorbidities associated with ASD, representing a major burden for autistic individuals. In fact, although prevalence estimates vary considerably, there is broad consensus that autistic individuals are at higher risk of developing depressive symptoms, as reflected in higher rates compared to the general population. More specifically, emerging research highlights how young adulthood may be a particularly vulnerable developmental stage, given the heightened challenges, increased social demand and reduced support systems potentially experienced during the transition to adulthood. However, considerable heterogeneity in results and estimates

reflects flaws in screening and measurement tools for depressive symptoms, contributing to depression being under-recognised and poorly understood in this specific population. Overall, given the potential negative impact of depression on the quality of life of autistic young adults, improving its recognition, assessment, and treatment, alongside advancing research on the mental health of this population, remains crucial.

2.2. Social support and depression in autistic individuals

2.2.1. Social support: its relationship with wellbeing in the general population

Social support is defined as "the provision of assistance or comfort to others, typically to help them cope with biological, psychological, and social stressors" (American Psychological Association, n.d.).

Social support has been linked to positive mental health outcomes in the general population. More specifically, a comprehensive systematic literature review found that evidence is overall consistent and supports the notion that social support is an important protective factor against depression (Gariépy et al., 2016). In fact, a number of studies have shown how loneliness (Cacioppo et al., 2006) and lack of social connectedness (Williams & Galliher, 2006) could be linked to the occurrence of depressive symptoms and predict suicide risk (Kleiman & Liu, 2013). Particularly in high-risk populations (Kleiman & Liu, 2013) and in the presence of stressful or traumatic life events (Meadows et al., 2005), social support has been identified as a protective factor against suicidal behaviour. Social support may not only be related to suicide risk directly, but also indirectly, since lack of social support can cause psychological distress and depression (Hefner & Eisenberg, 2009), which, in turn, are known to directly influence suicide ideation and attempt.

It is important to take into account different dimensions of social support, since they may contribute differently to wellbeing. Social support indeed encompasses concepts such as the availability of interpersonal resources and material support, as well as the degree to which the individual is integrated into society, and can be measured through the size and density of one's social network. However, these measures may not be as indicative of one's physical and mental wellbeing as perceived social support. Perceived social support is the subjective perception of the extent of support available if needed (Barrera, 1986) and has been linked to physical and mental wellbeing in the general population (Yeo et

al., 2025). Perception of social support was indeed found to predict lower levels of suicidal ideation (Chioqueta & Stiles, 2007), and it was shown that people with a diagnosis of depression are more likely to report low availability of social support from close others (Winefield, 1979). Given its protective role in the general population, perceived social support may be particularly relevant for autistic individuals, who often experience social isolation and barriers to social participation.

2.2.2. Perceived social support and depression in autistic individuals

Despite the evidence in the general population, there is limited research on the role of social support in the wellbeing and mental health of autistic individuals, and comprehensive evaluations of perceived social support in ASD are limited. A study by Lasgaard et al., (2010), found that adolescent autistic boys report higher rates of perceived loneliness compared to neurotypical peers, but that perceived social support is a potential buffer for loneliness. Research indicates that social isolation and loneliness are also common among autistic adults, and are associated with higher rates of depression and lower life satisfaction (Mazurek, 2014). This evidence may point to a potential role of social relationships in protecting autistic individuals against poor mental health outcomes. More specifically, given its relationships to wellbeing and mental health in the general population, perceived social support has recently started to be examined in autistic populations. However, the association between perceived social support and depression in autistic adults has not been extensively explored yet. Most research to date has indeed been focusing on autistic children or adolescents, with only a few studies exploring the relevance of social support in the mental wellbeing of autistic adults. Developmental needs in adulthood and, perhaps most saliently, during the transition to adulthood, may indeed intersect with the need for social support, making further research on the topic necessary. Moreover, in general, literature on the matter is inconsistent and results are not concordant across different studies, highlighting the complexity of the nature of social support and perceived social support in the autistic population.

A review by Segers and Rawana (2014), which included studies that collected data on emerging adults, highlighted the presence of a social support system for the autistic individual as a protective factor against suicidality, often associated to depression.

The authors emphasised the importance of studying the potential protective role of social support in the expression of depressive symptoms because of its potential implications in clinical practice, particularly for guiding the development of interventions that target social support networks (Segers & Rawana, 2014).

Gotham et al., (2014), examined the relationship between depressive symptoms and different psychosocial constructs, including satisfaction with social support, in a sample of autistic adolescents and young adults aged 16 to 35. In their sample, elevated scores in depressive symptoms were associated with lower perceived social support. This may indicate that the high prevalence of depression in the autistic population is related to the social isolation and lack of social support that autistic people experience. Moreover, the authors also investigated whether depression could be associated with a disparity between social motivation and actual opportunities for social participation. However, they found that individuals with higher social motivation and lower social participation did not actually appear to be particularly affected by depressive symptomatology, while the group that tended toward the highest depression scores was the one with a profile of both low social motivation and low social participation. The authors argued that this may mean that depression was the causal factor in this group, instead of the opposite, "as social anhedonia and amotivation are common symptoms of depression" (Gotham et al., 2014). By contrast, while they did find that autistic adults in this sample showed lower perceived social support ratings, especially from friends, compared to neurotypical controls, Alvarez-Fernandez et al., (2017), did not find any relationships between scores of perceived social support and ratings of depression. However, they used, as a measure of depression, a general screening questionnaire of psychopathology, which, according to the authors, may have failed to capture more nuanced depressive symptoms, potentially explaining the discrepancy with the results by Gotham et al., (2014). This, along with the common use of self-report measures alone, constitutes a challenge in research with this population, potentially limiting results. As a matter of fact, the authors argue that a more comprehensive assessment of these measures should include multiple informants.

Similarly, Hedley et al., (2017), examined social support as a potential protective factor for depression and suicidal ideation in autistic adults. One of their hypotheses was that social support, in terms of appraisal (helping to cope with stressful events) or belonging, would be a protective factor for suicidality in autistic adults, as has been suggested for

the general population. However, neither of these measures was found to be significantly associated with either depressive symptoms or suicidal ideation. The proposed explanation for the results is that autistic individuals may benefit more from the availability of material support compared to other forms of social support. Moreover, they only used a self-report measure for depressive symptoms and suggested the use of multi-informant assessments in future research.

In a subsequent study with a larger sample of autistic adolescents and adults, Hedley et al., (2018), once again examined loneliness and social support as potential risk and protective factors associated with depression and suicidal ideation. They found depression and suicidal ideation to be positively correlated with loneliness and negatively correlated with social support. More specifically, lower levels of social support, both in terms of the number of social supports and satisfaction with available social support, and higher loneliness, were associated with depression and suicidal ideation. More specifically, it seemed that the effect of the number of social supports on depression was mediated by loneliness and satisfaction with social support, and that the effects of loneliness and satisfaction with social support on suicidal ideation were mediated by depression. The authors highlight the potential importance of their findings for the development of interventions for reducing depression and suicidal ideation risk in ASD, making loneliness and social support possible targets. Finally, they also used self-report assessments for all the measures in the study, noting however that it is important to better assess their reliability in measuring concepts such as depression, suicidal ideation, social support and loneliness.

A literature review including these and similar studies on autistic adolescents and adults indeed found that "perception of a lack of tangible social support, as well as feeling different from others, were associated with increased symptoms of depression" (Smith & White, 2020). The authors of the review hypothesised that social interaction may hold significant value for many autistic individuals, who may in turn develop depressive symptoms when social needs and attempts to build close relationships are unfulfilled.

Overall, existing evidence suggests that perceived social support may be closely associated with psychological wellbeing in autistic individuals, including adults and young adults. However, the heterogeneity of findings and assessment measures, alongside the scarcity of research on autistic young adults, highlights the need for further

investigation into the complex role of perceived social support for the wellbeing of this population.

2.3. Adaptive behaviour in autistic individuals and its relationship with co-occurring psychopathology

Adaptive behaviour is defined by Harrison & Oakland (2008) as "a constellation of skills" necessary for an individual to effectively function in different environments and contexts, such as home, school, work and the community. These skills are crucial for a person to meet their personal needs and deal with environmental and social demands in the aforementioned contexts. Adaptive behaviour is generally considered a multidimensional construct and encompasses skills from three broad areas of functioning: conceptual skills, including language, literacy and the understanding of concepts such as time, money, and numbers; social skills, such as interpersonal relationships, social responsibility and the adherence to social norms; and practical skills, including personal care, health and safety, domestic activities and other daily living skills (Schalock et al., 2010). Importantly, the concept refers to the actual manifestation of these skills, not to the potential abilities of an individual to perform them. Moreover, it is age- and context-dependent, being it shaped by developmental and environmental factors.

Deficits in adaptive functioning can substantially influence everyday living and, although it is important to distinguish adaptive behaviour from the concept of intelligence, such deficits are commonly observed in neurodevelopmental conditions, particularly in individuals with Intellectual Disability (Schalock et al., 2010). In fact, in the general population, performance in these real-life skills is somewhat consistent with a person's cognitive ability, meaning that, generally, those with lower adaptive behaviours tend to also exhibit lower IQ (Alexander & Reynolds, 2020). In the context of autism, this construct is particularly relevant because it includes daily living skills, communication, socialisation and independence. In addition, research highlights how, in autistic populations, adaptive behaviour is a stronger predictor of overall wellbeing compared to IQ (Farley et al., 2009). Even though research on factors influencing adaptive skills in adults is still limited, autistic children and adolescents seem to score lower in adaptive behaviour ratings compared to neurotypical individuals (Pugliese et al., 2015). Additionally, autistic children and adolescents do not appear to follow the same trajectory

as typically developing individuals when it comes to the association between IQ and adaptive functioning: significant gaps are observed between cognitive level and adaptive behaviour, specifically in those with higher or average IQ (Kanne et al., 2011). Declines or stalls in adaptive skills are found in autistic individuals as they age, with the discrepancy between cognitive and adaptive abilities widening as age increases (Pugliese et al., 2015). Factors contributing to this outcome in adulthood have yet to be thoroughly explored.

In the general population, problems in daily living skills and communication skills were found to be associated with internalising symptoms and, specifically, depression (Çıkrıkçı, 2024; Zhou et al., 2024). Although further investigation is needed to examine this relationship, depressive symptoms may interfere with the individuals' initiative, thus reducing engagement in daily living and social tasks and negatively affecting communication and daily living skill domains.

Literature on the association between co-occurring psychopathology and adaptive behaviour in autistic individuals, however, remains lacking. There are theories proposing that comorbid psychopathology may compromise autistic people's adaptive functioning (Pezzimenti et al., 2019), but empirical evidence on the topic remains scarce and heterogeneous, especially in adults. Duan et al., (2022), explored this association in a sample of autistic children and adolescents, measuring depressive symptoms and assessing their impact on different domains of adaptive functioning. They found that high depression scores predicted low social adaptive skills but were not associated with daily living skills. In a similar study, Davidsson et al., (2017), found a negative correlation between self-reported depression of autistic adolescents and parental-reported communication skills, everyday skills, and social skills. These findings may suggest that depression amplifies difficulties in adaptive functioning of autistic children and adolescents.

Investigating these associations in autistic adults is also particularly important, as adaptive behaviour is a strong predictor of adult optimal outcome (Farley et al., 2009) and autistic individuals transitioning to adulthood face new challenges and expectations related to independence.

In a sample of autistic adults without intellectual disability, Kraper et al., (2017) assessed adaptive function and comorbid psychopathology and found that high levels of depression

were associated with the discrepancy between cognitive and adaptive functioning. Although the data are correlational, they may point to a higher risk of poor adaptive functioning in the presence of depression. The results of this study may be explained by cognitive skills not translating into successful adult adaptive functioning, which may increase the risk of developing co-occurring psychopathology in those with greater self-awareness. Alternatively, similarly to what seems to happen in neurotypical individuals, elevated depressive symptoms may impact the ability to engage in daily living and socialisation tasks expected from adults.

Significant negative correlations between psychopathology, including depression, and adaptive behaviour were also found in a sample of autistic young adults (Zukerman et al., 2019). However, no statistically significant differences between the ASD group and the control group were found in the correlations between these variables. This could mean that psychiatric symptoms are similarly associated with adaptive skills in both ASD and non-ASD populations.

Although adaptive functioning appears to be an important determinant of wellbeing and adult outcomes in autistic individuals, research looking at factors associated with adaptive functioning, including mental health symptoms, is still limited and inconsistent. While the existing literature seems to point to an association between comorbid psychopathology and adaptive behaviour, further evidence is needed to clarify this relationship, encompassing the different domains of adaptive behaviour, especially among autistic adults and young adults, who may experience increasing difficulties in a phase of new challenges and expectations.

Chapter 3

The research project

3.1. Aims

The current study is part of a broader research project exploring possible predictors of adaptive functioning in young adults diagnosed with ASD, with or without mild intellectual disability. More specifically, within the context of this broader research project, and in light of recent literature, the aim of the present study is to investigate the levels of depressive symptoms in autistic young adults aged between 18 and 45 years. To address limitations associated with single-informant measures highlighted by previous research (Alvarez-Fernandez et al., 2017; Hassiotis & Turk, 2012; Hedley et al., 2017, 2018), an integrative assessment was carried out using both self-report and parent-report measures.

In particular, the study explores the association between depressive symptoms and perceived social support, as well as between depressive symptoms and adaptive practical and social behaviour.

Although previous findings in autistic populations have been mixed, given the role commonly attributed to social support in psychological wellbeing in the general population, it has been hypothesised that higher levels of perceived social support would be associated with lower levels of depressive symptoms (Gotham et al., 2014; Smith & White, 2020). However, due to the heterogeneity in the measures used and the social support dimensions assessed in previous research, full consistency across different dimensions of social support is unlikely.

A second hypothesis is that lower adaptive social and practical behaviour would be associated with higher scores on measures of depressive symptoms. However, literature investigating these associations is limited, particularly in the population of autistic young adults, and this hypothesis remains exploratory (Kraper et al., 2017; Zukerman et al., 2019).

Finally, given recent findings and concerns regarding the validity of different measures of psychological constructs in autism (Pezzimenti et al., 2019), full agreement between self-report and parent-report measures of depressive symptomatology is not expected.

3.2. Methods

The following section will cover the methodology adopted in order to collect data for the present study. In particular, participants' recruitment methods and the characteristics of the sample used will be outlined, all the screening and experimental materials will be thoroughly described, and procedures followed during all the phases of the study will be illustrated.

In the data collection phase, instruments aimed at assessing the dimensions relevant to the broader research project within which the present study is situated were used, including cognitive functioning, autistic symptomatology, emotional wellbeing, perceived social support, and the psychological impact of diagnosis. However, the instruments described in this section, and for which the analysis of data will be carried out, are those used for participant screening and for the purpose of the current study, including self-report and parent-report measures of depression, a self-report measure of perceived social support, and a parent-report measure of adaptive behaviour.

3.2.1. Participants

The inclusion criteria targeted young adults aged between 18 and 45 years and the sample of the present research included 20 participants aged between 18 and 40 years, with a diagnosis of ASD and with or without mild Intellectual Disability. The mean age of the whole sample, including 18 males and 2 females, expressed in years, is 27.3 (SD = 6.35). The study also included the involvement of one parent for each participant, who was interviewed by telephone regarding the developmental history and problem behaviours of their son or daughter and who was subsequently required to complete online questionnaires in order to gather information regarding their son's or daughter's symptoms and behaviours from a different perspective.

3.2.2. Materials

3.2.2.1. Screening instruments

- *Wechsler Adult Intelligence Scale – fourth edition* (WAIS-IV; Wechsler, 2008)

The first instrument used for participant screening is the Wechsler Adult Intelligence Scale – fourth edition (WAIS-IV; Wechsler, 2008), a clinical tool administered to evaluate intellectual abilities of individuals aged 16 to 90 years and 11 months of age.

WAIS-IV is composed of 10 core subtests for the formulation of a Full Scale IQ, and 5 supplementary subtests that can substitute the core ones or be administered in addition to them for an in-depth analysis. This instrument provides four composite scores, representing intellectual functioning in four different cognitive areas: Verbal Comprehension Index (VCI), Perceptual Reasoning Index (PRI), Working Memory Index (WMI) and Processing Speed Index (PSI). Moreover, it provides a composite score representing general intellectual ability, called Full Scale IQ (FSIQ).

For the current study, the Italian version of WAIS-IV was used (Orsini & Pezzuti, 2013), and, in order to assess an estimate of the global intellectual functioning of participants, the Vocabulary subtest and the Block Design subtest were administered. The sum of the weighted scores for these subtests was standardised by age and used to obtain a short form of the FSIQ.

Vocabulary is a core subtest contributing to the VCI and consists of 30 items, including 3 picture items and 27 verbal items. The examinee has to name visually presented objects, in the case of picture items, and has to define visually and orally presented words, in the case of verbal items. For everyone aged over 16, the administration starts at item 5 and the preceding items are only administered in reverse order in the case where the examinee does not obtain the maximum score in either the 5^{th} or the 6^{th} item. For the first 3 items, 1 point is given for a correct answer and 0 for an incorrect one, while for the following items, 2 points are given for a correct and exhaustive answer, 1 point for a correct but unspecific answer and 0 for a wrong answer. The administration must be suspended after 3 consecutive scores of zero.

The vocabulary subtest measures the subject's lexical competency, verbal reasoning, conceptualisation, comprehension and expression, the ability to evaluate and use past experience and to demonstrate practical knowledge and judgment. This subtest is indeed centred around crystallised intelligence, other than knowledge of conventional standards of behaviour, social judgment and common sense, and long term memory.

Block Design is a core subtest included in the PRI. For this subtest, the subject has to reproduce designs combining coloured blocks – with some white, some red and some half-white and half-red faces, as shown in *Figure 3.1*. Block Design is composed of 14 items and, after an example, the administration for people aged over 16 starts from item 5 and goes back to the preceding ones only if the subject does not obtain a full scoring in

the 5th or 6th items. For the first 4 items, the examinee directly combines the blocks after the examiner's demonstration, while, for the subsequent items, they have to copy figures from the model displayed in the stimulus book.

For the first 4 items, 2 points are given for a correct answer at the first trial, 1 for a correct answer at the second trial and 0 for an incorrect answer at both trials. For the following four items, 4 points are given for a correct answer and 0 for an incorrect one, while for the remaining items, 0 points are given for an incorrect answer and from 4 to 7 points to a correct one, depending both on the correctness of the figure and the speed of its execution.

The abilities implicated in this task include analysing and synthesising abstract visual stimuli, visual perception, the ability to isolate the figure from the background, to break down the model into its component parts and reassemble it, and to mentally rotate the figure, visuo-motor coordination and the ability to organise images on the basis of the perceived stimulus. This task is indeed centred around the ability of forming concepts and of non-verbal reasoning, and around visual intelligence, fluid intelligence, visual organisation and simultaneous processing and learning.

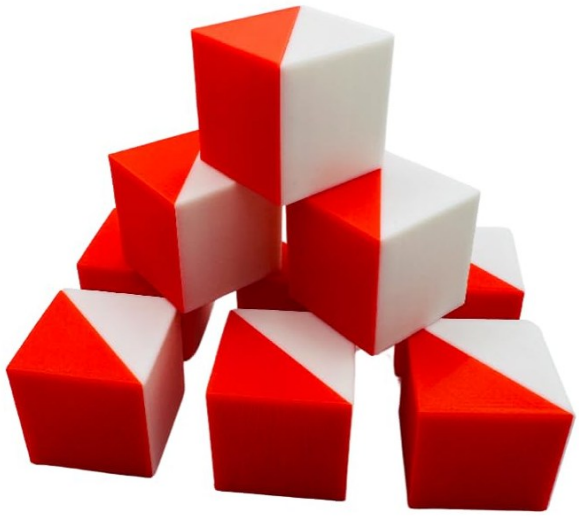


Figure 3.1. Example of the Block Design subtest from the WAIS-IV.

- *Social Responsiveness Scale – Second Edition* (SRS-2; Constantino, 2021)

The second screening instrument used is the Social Responsiveness Scale – Second Edition (SRS-2; Constantino, 2021), designed to identify the presence and severity of social impairment in the mildest and most common forms of ASD and to differentiate it

from that which occurs in other disorders. In particular, it measures some aspects of reciprocal social behaviour, communication and repetitive and stereotyped behaviour, typical in the manifestation of ASD. This instrument is versatile and can be used in different contexts and for screening, the diagnostic process and treatment design.

The SRS-2 has 65 items and includes a partially different module depending on the studied age range: preschool form for ages 2.5 to 4.5 years, school form for ages 4 to 18 years and adulthood form for 19 to 89 years. The SRS-2 asks educators, parents, other caregivers or the individuals themselves to rate symptoms observed over time, evaluated on a quantitative scale representing a range of severity.

Through this approach, using different perspectives on observed behaviour and rating on a graduated response scale, rather than a "yes-or-no" response style, it is possible to reveal a wide range of symptoms, including those that are relatively subtle. This is important because even mild social impairment can have an adverse effect on autistic individuals.

In the present study, the Italian version (D'Ardia et al., 2021) of the other-report scale for ages 19 and up was administered to parents via online questionnaires with independent completion through the Qualtrics platform (https://www.qualtrics.com/). Specifically, parents were asked to rate how much each item reflected their son's or daughter's behaviour in the last 6 months on a 4-point Likert scale from "not true" (0) to "almost always true" (3).

The severity of social deficits in the autism spectrum is represented by the Total score of SRS-2, but additional scores relative to the symptomatologic macro-areas of DSM-5 can be obtained: Communication and Interaction (SCI) and Restricted and Repetitive Behaviour (RRB).

Moreover, subscales include:

- Social Awareness (AWR), evaluating the ability to perceive social cues (8 items)
- Social Cognition (COG), exploring the ability to interpret social cues once perceived (12 items)
- Social Communication (COM), evaluating expressive social communication and "motor aspects" of reciprocal social behaviour (22 items)
- Social Motivation (MOT), indicating the level of motivation of the individual to engage in a social-interpersonal behaviour (11 items)

- Restricted and Repetitive Behaviour (RRB), exploring stereotyped behaviour and restricted interests (12 items)

The raw Total Score, obtained from the sum of all the single items or the subscales, is then transformed into a standardised score in order to obtain a measure of severity of social deficits. The higher the Total Score, the higher the autistic symptomatology, and the higher a subscale score, the higher the deficits in that specific domain.

3.2.2.2. Experimental instruments

- *Autistic Depression Assessment Tool - Adult Version* (ADAT-A; Cassidy et al., 2021)

The Autistic Depression Assessment Tool - Adult Version (ADAT-A; Cassidy et al., 2021) is a self-report instrument designed to assess depressive symptoms in autistic adults without Intellectual Disability. The questionnaire includes 21 items and was initially devised for online research studies. It is able to disentangle overlapping characteristics of depression and autism and capture autism-specific signs of depression by exploring change in these behaviours from the individual's baseline. 13 of the 21 items were developed to better capture depressive symptoms according to DSM-5 and ICD-10 criteria, while the additional 8 items were developed to capture autism-specific indicators of depression not currently included in previous depression measures.

Three subscales measuring different components of depression in autistic adults can be obtained, two of which capture depressive symptoms as described in the diagnostic manuals criteria: the Cognitive-Affective Symptoms subscale and the Somatic Symptoms subscale. A third subscale captures Autism-Specific Depressive Symptoms.

The items of the questionnaire describe depressive symptoms and individuals are asked to respond to staged questions referring to the past 14 days. The first stage assesses the presence (yes/no) of the difficulty in the past 14 days. If present, the second stage assesses the length of time the difficulty has been experienced for within the same 14-day period (from 1-3 days (1) to 12-14 days (4)). The third and last stage evaluates the impact of the symptom on everyday functioning (from "Never" (1) to "Extremely" (4)).

Answering "no" to an item is scored 0, and length of time and impact are scored from 1 to 4. Scores across the sections are summed to obtain individual item scores from 0 to 8, with total scores ranging from 0 to 168, and higher scores indicating a greater number and impact of depressive symptoms in the past 14 days.

- *Patient Health Questionnaire-9* (PHQ-9; Spitzer et al., 1999)

The Patient Health Questionnaire-9 (PHQ-9; Spitzer et al., 1999) is a brief questionnaire developed for primary care screening, diagnosis, monitoring and measurement of severity of depression. In the current study, both the self-report and the other-report questionnaires were administered respectively to participants, through guided completion of an online questionnaire in the Qualtrics platform, and to parents, via independent completion of an online questionnaire on the Qualtrics platform.

PHQ-9 is composed of 9 items that investigate Major Depression symptoms in the last 2 weeks according to DSM-IV, with the presence of each symptom evaluated on a 4-point scale, from "never" (0), to "almost every day" (3).

The scoring ranges between 0 and 27, with scores between 0 and 9 indicating subthreshold depression, and scores of 10 or above considered optimal for the instrument's sensitivity and specificity in identifying clinically significant depression.

Subsequently, a second question evaluates the functional impairment of depression in everyday functioning.

The level of severity of depression is then obtained according to the score on the 9 symptoms:

- 5-9 = Minimal depressive symptoms, subthreshold depression
- 10-14 = Minor Depression, mild Major Depression
- 15-19 = Moderate Major Depression
- ≥ 20 = Severe Major Depression

- *Multidimensional Scale of Perceived Social Support* (MSPSS; Zimet et al., 1988)

The Multidimensional Scale of Perceived Social Support (MSPSS; Zimet et al., 1988) is a self-report instrument used to explore perceived social support in individuals aged 13 and up. The MSPSS is composed of 12 items, making it quick and easy to administer while at the same time having good psychometric validity and reliability.

This questionnaire allows to obtain a total score for perceived social support, along with separate scores relative to social support from the family, from friends and from a significant other.

Participants must choose, for each item, how much they agree with the statement, using a 7-point Likert scale, going from "Strongly disagree" (1) to "Strongly agree" (7).
For each sub-scale, Family, Friends, and Significant Other, a score can be calculated, and, by summing the subscale scores, the total score of perceived social support can be obtained. The higher the score, which can range from 12 to 84, the higher the perceived level of social support.

- *Adaptive Behaviour Assessment System – Second Edition* (ABAS-II; Oakland & Harrison, 2008)

The Adaptive Behaviour Assessment System – Second Edition (ABAS-II; Oakland & Harrison, 2008) is a measure of adaptive behaviour for ages between 0 and 89 years. More specifically, ABAS-II measures daily life abilities, what individuals are able to do without others' help, on 10 different adaptive areas. The latter can be ascribed to 3 main domains of adaptive behaviour:

- Conceptual, including communication and self-control
- Social, including leisure and socialisation
- Practical, encompassing self-care, home living, health and safety and community use

Five modules have been devised, based on age, with the version for people aged 16 to 89 years also including a self-report module. In the current study, the Italian version (Ferri et al., 2014) of the other-report module for individuals aged between 16 and 89 years was used. Specifically, the scales for the adaptive areas of Community Use, Self-care, Home Living and Health and Safety were used to obtain a Practical Domain (PD) score. Moreover, the scale for the adaptive area of Socialisation was administered. All the scales were administered via a structured interview format.
Parents had to rate the frequency with which their son or daughter independently performed specific behaviours on a 4-point Likert scale going from "is not able" (0) to "always when needed" (3). They were also asked to indicate whether the behaviour had been directly observed or whether the rating was based on inference.
Scores obtained for each of the adaptive areas are transformed into weighted scores, then used to calculate normative scores, based on age, for the adaptive domains, indicating the level of performance of the individual in a specific domain.

3.2.3. Procedure

Data collection for the current study was carried out in the 2025/2026 Academic Year, between the months of February and April 2026. The recruitment of participants who met inclusion criteria - young adults between 18 and 45 years of age with a diagnosis of ASD, with or without mild Intellectual Disability - was carried out in Italy through the collaboration with the Adult Mental Health Department within the Public Health System of Tuscany and through community-based social services in the city of La Spezia, in Liguria.

Mental health professionals, parents and participants were informed about the aims of the research. The implications of participation were clearly communicated, orally and through an official presentation letter, including the length and the nature of the interviews for both parents and for potential participants.

Prior to the first meetings, an informed consent form was shared with participants or their parents, in case of legal administration, specifying all phases of the data collection, their duration and the possibility of withdrawing from the study without any consequence. In addition, in order to ensure compliance with the inclusion criteria for each person interested in participating, clinical documentation regarding diagnosis and cognitive profile was collected and used following current regulations on data protection.

Data collection included one or two in-person meetings with autistic participants and one telephone interview with one of their parents, followed by the independent completion by the parent of an online questionnaire using the Qualtrics platform.

Interviews with participants were carried out in quiet and private environments, in rooms made available by the Public Adult Mental Health Services of Tuscany and the private associations through which participants were recruited.

For those who had not completed it in the last year, activities began with the administration of the WAIS-IV subtests. This administration lasted, on average, 40 minutes and allowed an estimation of the cognitive profiles of participants. Subsequently, during the same encounter, guided administration of questionnaires was carried out: questions were visualised on a computer or tablet on the Qualtrics platform and read out loud by the experimenter, who provided additional explanation when needed; answers

were given by participants and inserted by the experimenter on the platform, for a total duration of about 20 minutes.

For the two participants with mild Intellectual Disability, only one encounter was necessary and all the appropriate measures, including the WAIS-IV Vocabulary and Block Design subtests, the PHQ-9 and the MSPSS, were administered during this occasion. For all other participants, whether the administration was divided into two encounters depended on their preference and needs. If they did not request to complete all activities in one meeting, the WAIS-IV, the PHQ-9 and the ADAT-A were administered during the first encounter, while the MSPSS during the second one.

The telephone interview with parents was arranged either before or after the encounters with participants, depending on the availability of parents. During the interview, the developmental history of the participant was explored with ad-hoc questions and a checklist of problem behaviours. Subsequently, the ABAS-II was administered by reading items aloud and asking parents to provide verbal responses. The subscales of Community Use, Home Living, Health and Safety, Self-Care and Socialisation, were used to assess participants' adaptive behaviour in these domains. Afterwards, a link to a Qualtrics questionnaire was provided to parents, who independently completed other-report versions of the SRS-2 and of the PHQ-9.

The questionnaires registered on Qualtrics were completely anonymous and an alphanumeric code was associated with participants and inserted at every questionnaire completion, including the independent parent-report questionnaires, for which the appropriate code was provided to parents.

Finally, once all interviews and independent compilations had been completed, scoring and conversion of tests and questionnaires were carried out, followed by analysis of the obtained results.

Chapter 4

Results

In the current chapter, the results of the study will be presented. Firstly, results of screening tests will be analysed; secondly, descriptive statistics of experimental tests will be presented, followed by correlational analyses.

Analyses of data were carried out on a sample of 20 autistic young adults aged between 18 and 40 years.

For the analyses of results, both descriptive and correlational, the IBM SPSS Statistics (Version 32.0) was used. The graphs were created using the JASP 0.97.0 (JASP Team, 2026) programme.

4.1. Participants

In the current study, 20 young adults with a diagnosis of Autism Spectrum Disorder, with or without mild Intellectual Disability (ID), were included. Table 4.1 summarises the descriptive statistics for participants' age.

Variable	***Mean (SD)***	***Minimum***	***Maximum***
Age	27.35 (6.335)	18.00	40.00

Table 4.1. Descriptive statistics of participants' age

4.2. Screening tests

The following paragraph illustrates descriptive analyses of results from the tests used for screening participants, with relative tables displaying the Mean, Standard Deviation (SD) and the minimum and maximum values.

4.2.1. Short-form FSIQ (WAIS-IV)

To obtain an estimate of participants' global intellectual functioning, the Vocabulary (VC) and Block Design (BD) subtests of the WAIS-IV (Wechsler, 2008; Italian edition, Orsini & Pezzuti, 2013) were administered. The sum of the scaled scores for these subtests was standardised by age and converted into a short-form FSIQ score.

Variable	***Mean (SD)***	***Minimum***	***Maximum***
Short-form FSIQ	90.95 (17.33)	61.00	125.00

Table 4.2. Descriptive statistics of the short-form Full-Scale Intelligence Quotient (FSIQ) scores

Considering that the standard mean for short-form FSIQ is 100 (SD=15), the mean score of participants reported in Table 4.2. is consistent with the characteristics of a predominantly non-ID autistic sample, while the relatively high standard deviation (SD) indicates considerable variability in performance, consistent with the heterogeneity typically observed among autistic individuals.

4.2.2. SRS-2

The other-report version of the SRS-2 (Constantino, 2021) was administered to parents to assess participants' socio-communicative functioning, as well as restricted and repetitive interests and behaviours.

Variable	***Mean (SD)***	***Minimum***	***Maximum***
SRS-2	65.55 (11.72)	47.00	90.00

Table 4.3. Descriptive statistics of the SRS-2 scores

As shown in Table 4.3., the mean of the T-scores on the SRS-2 indicates clinically significant levels of autistic traits. In fact, SRS-2 T-scores are standardised at a population mean of 50, with a standard deviation of 10, meaning the sample mean (M= 65.55; SD= 11.72) falls more than one standard deviation over normative average. This means the threshold typically associated with clinically significant difficulties related to socio-communicative functioning and restricted and repetitive interests is exceeded, as would be expected in a sample of autistic young adults.

4.3. Experimental tests: descriptive statistics

The following section presents descriptive analyses of results obtained from the tests administered during the experimental phase of the study. Corresponding tables and graphs are included to illustrate the distribution of participants' scores.

4.3.1. ADAT-A

The ADAT-A (Cassidy et al., 2020) was administered in order to assess the presence, duration, and impact of depressive symptoms. Specifically, the questionnaire assesses the

categories of Cognitive-Affective symptoms, Somatic symptoms and Autism-specific symptoms.

ADAT-A subscales	*Mean (SD)*	*Minimum*	*Maximum*
Cognitive-Affective	6.0 (5.076)	0.00	20.00
Somatic	11.17 (9.865)	0.00	33.00
Autism-specific	12.22 (9.962)	2.00	36.00
Total	29.39 (19.25)	2.00	79.00

Table 4.4. Descriptive statistics of the ADAT-A and its subscales' scores

As shown in Table 4.4., the mean total ADAT-A score among the18 participants without ID is relatively low, given the maximum possible score of 168. However, the standard deviation and the wide score range, going from 2 to 79, indicate substantial variability across participants. Considerable variability is also observed across the three subscales, which are not directly comparable in terms of scores, since each includes a different number of items and no standardisation of scores is available. Nevertheless, mean scores of subscales reported in Table 4.4. appear relatively low in relation to their maximum possible scores, which are 48 for Cognitive-Affective symptoms, 56 for Somatic symptoms and 64 for autism-specific symptoms.

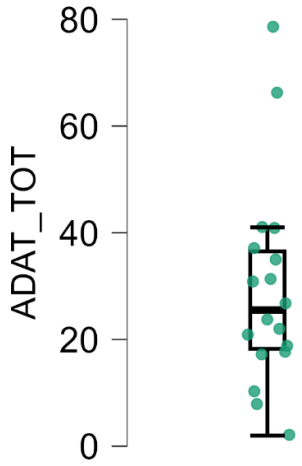


Figure 4.1. Scatterplot and boxplot of the distribution of total ADAT-A scores

Figure 4.1. displays a boxplot and scatterplot representing the total scores of the ADAT-A questionnaire and the score distribution for each participant. The y-axis indicates ADAT-A scores, which can range from 0 to 168. The scores of the sample are distributed approximately within the range between 0 and 80 represented in the graph, with a median

around 25, and an interquartile range going from slightly below 20 to about 35. Excluding outliers, the minimum score appears to be 2, while the maximum is around 40. However, two outliers are present above 60 points, and, generally, considerable variability is observed across participants.

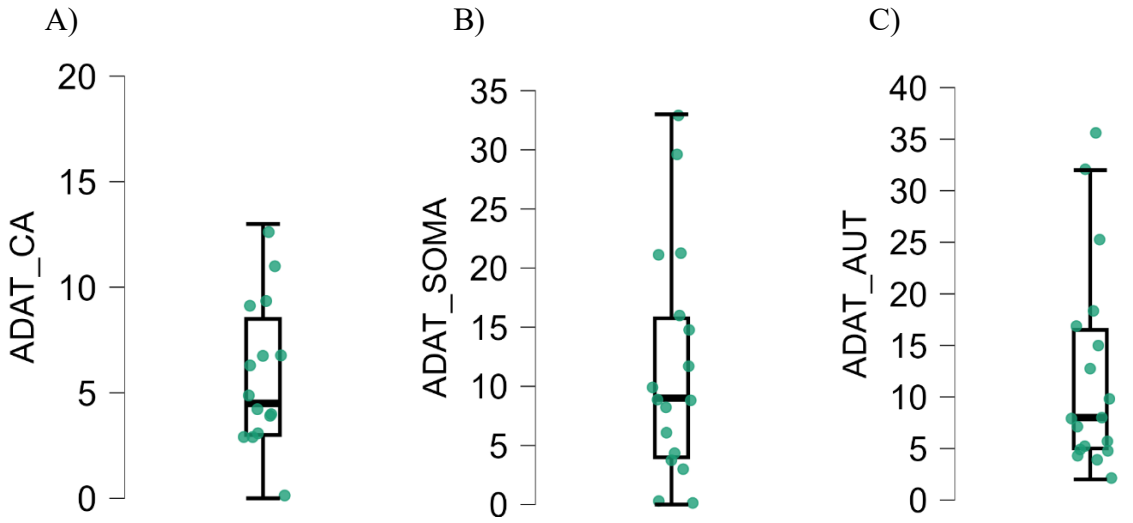


Figure 4.3.: Panel A, Panel B, Panel C. Scatterplots and boxplots of the distribution of, respectively, Cognitive-affective (CA), Somatic (SOMA) and autism-specific (AUT) ADAT-A scores

Panel A, Panel B and Panel C of Figure 4.3 show scatterplots and boxplots representing respectively the Cognitive-Affective, the Somatic and the autism-specific domain scores of the ADAT-A questionnaire, as well as the distribution of each participant's score on these subscales. The three domains cannot be represented within a single graph because they are scored on a different scale, due to the different total number of questions included in each subscale. In Panel A, the y-axis for the Cognitive-Affective domain ranges from 0 to 20, with the scores of the present sample ranging between 0 and about 15. In Panel B, the y-axis for the Somatic domain ranges from 0 to 35, with scores distributed across nearly the whole interval. In Panel C, the y-axis of the autism-specific domain ranges from 0 to 40, with participant scores also spanning most of the available interval. By observing Panel A, it emerges that the Cognitive-Affective domain has a median of about 4 and an interquartile range between approximately 3 and 8. In Panel B, the median of the Somatic domain is displayed at around 9, and the interquartile range goes from about 4 to 16. The last graph, in Panel C, displays the median of the autism-specific domain at around 7, with an interquartile range going from about 5 to about 16. Overall, the graph

that shows the less variability in scores is the cognitive-affective subscale one, given that the maximum possible score in this domain is 48 and the sample's scores range between 0 and 14, meaning they are clustered in the lower half of the scale. Meanwhile, the somatic and autism-specific domains show more or less a similar and a moderate level of variability, with minimum scores around or slightly above 0 and maximum scores at about 35. However, scores in this domain can reach maximum values of 56 and 64 respectively, suggesting depression levels of this sample are distributed in the lower half of the scale for these two domains as well.

4.3.2. PHQ-9

The self-report and the other-report versions of the PHQ-9 (Spitzer et al., 1999) were administered respectively to participants and to parents to assess the presence and severity of symptoms of depression.

PHQ-9 version	***Mean (SD)***	***Minimum***	***Maximum***
Self-report	18.40 (3.803)	10.00	26.00
Parent-report	14.95 (4.383)	10.00	27.00

Table 4.5. Descriptive statistics of PHQ-9 – self-report and parent-report – scores

As reported in Table 4.5, the mean score for the PHQ-9 was somewhat higher for the self-report version compared to the parent-report version. In fact, according to the PHQ-9 severity classification described in Chapter 3, the mean self-report score of 18.40 (SD= 3.804) falls within the range of moderate Major Depression and is borderline with severe Major Depression. Meanwhile, the mean score of the parent-report version (M= 14.95; SD= 4.383) falls borderline ranges representing Minor Depression or mild Major Depression and moderate Major Depression.

Nevertheless, the minimum score of both versions is 10.00, which corresponds to the cutoff for the clinically significant presence of depressive symptoms. This means that scores for all participants in the sample, on both measures, would fall at least within the range suggesting probable presence of mild depressive symptoms, and would therefore require clinical attention.

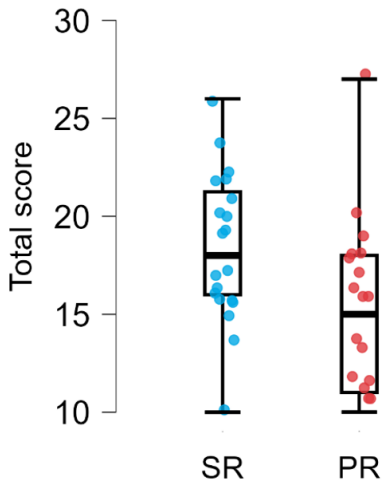


Figure 4.4. Scatterplots and boxplots of the distributions of, respectively, self-report (SR) and parent-report (PR) version of PHQ-9

Figure 4.4. displays scatterplots and boxplots of the scores on self-report (SR) and parent-report (PR) versions of the PHQ-9, with the distributions of single participants' scores. The x-axis reports the two versions of the questionnaire, while the y-axis displays the total score of depressive symptoms, which can range from 0 to 27. The median of the scores on the self-report measure is around 17, with an interquartile range going approximately from 16 to 23. The parent-report graph shows a median of about 15, and an interquartile range between around 11 and 17.

Both graphs display substantial variability in distribution, with self-report scores ranging from 10 to 26, and parent-report scores ranging from about 10 to 20 for most observations, with only one higher variable reaching the maximum possible score. Overall, scores from the self-report questionnaire appear to be generally slightly higher, with the majority of them being above 15, compared to the parent-report scores, which are mainly distributed below 20.

4.3.3. MSPSS

The MSPSS (Zimet et al., 1998) was used to explore levels of perceived social support from family, friends, and a significant other in the current sample.

MSPSS	***Mean (SD)***	*Minimum*	*Maximum*
Other	21.10 (5.076)	10.00	28.00
Family	21.80 (9.865)	12.00	28.00
Friends	19.95 (9.962)	6.00	28.00

Total	62.85 (19.25)	45.00	82.00

Table 4.6. Descriptive statistics of the MSPSS and its subscales' scores

As demonstrated by mean scores in Table 4.6., levels of perceived social support in the sample appear to be relatively high. Given that MSPSS total scores can range from 12 to 84, the sample mean of 62.85 (SD= 19.25), with scores ranging from 45 to 82, suggests generally high perceived social support among participants. However, it is important to note that the relatively high standard deviation (SD= 19.25) may suggest either substantial variability across participants or the presence of a small number of extreme values.

The mean scores of the three subscales are relatively similar, suggesting a degree consistency in the levels of social support perceived by participants from different sources.

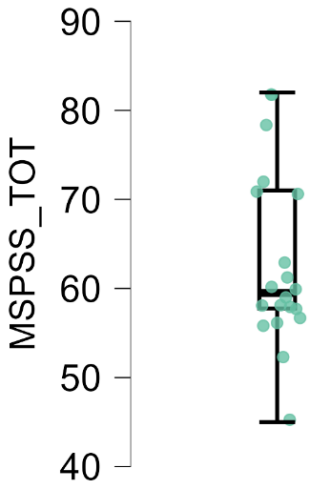
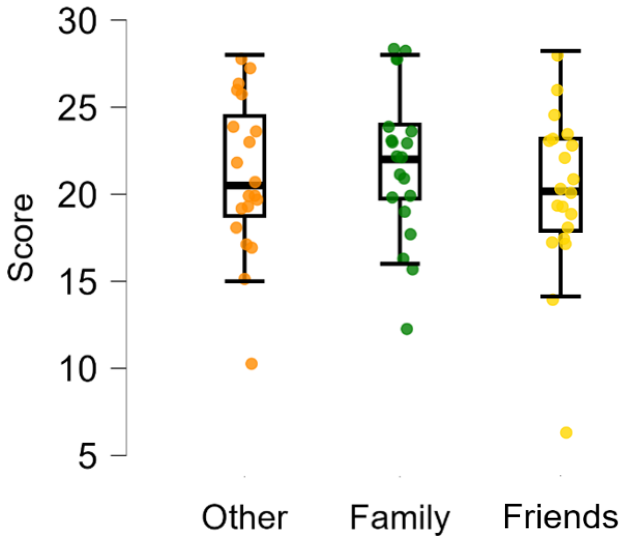


Figure 4.5. Scatterplot and boxplot of the distribution of total MSPSS scores

Figure 4.5. displays a boxplot and scatterplot of the MSPSS total scores, with the distribution of individual participant's score. The y-axis represents total MSPSS scores, which can range from 12 to 84. The distribution shows a median of approximately 60, with an interquartile range of roughly 58 to 70. The minimum score appears to be around 45 and the maximum slightly above 80, indicating moderate variability in scores, with most values clustered around the median and a small number of extreme values.



Figures 4.6. Scatterplots and boxplots of the distribution of the Other, Family and Friends dimensions of the MSPSS

Figure 4.6. presents boxplots and scatterplots for the MSPSS subscale scores, showing the distribution of perceived social support across the dimensions of Other, Family and Friends. The x-axis reports the three subscales, while the y-axis represents total subscale scores, which range from 4 to 28 for each scale. The Other subscale shows a median of approximately 20, and an interquartile range from about 18 to just below 25. The Family subscale has a slightly higher median, around 23, with an interquartile range from just under 20 to approximately 24. The Friends subscale presents a median of about 20, with an interquartile range approximately from 17 to 23. Overall, the three subscales show broadly similar distributions, with comparable ranges of scores, going from around 15 to 28 in all three scales, aside from isolated outliers. This indicates a relatively consistent level of perceived social support from different sources.

4.3.4. ABAS-II

To obtain a measure of the adaptive functioning of participants, selected subscales of the ABAS-II (Harrison & Oakland, 2008) were administered to parents. A composite Practical Domain score was calculated adding up the scores of the scales for the adaptive areas of Community Use, Self-care, Home Living, and Health and Safety. Moreover, the scale for the adaptive area of Socialisation was administered to explore socio-relational abilities of participants.

ABAS-II	*Mean (SD)*	*Minimum*	*Maximum*
Practical Domain	90.05 (13.74)	69.00	120.0
Socialisation	6.650 (1.843)	4.000	11.00

Table 4.7. Descriptive statistics of the Practical Domain and Socialisation area of the ABAS-II

By observing data in Table 4.7., it emerges that the mean of Practical Domain scores (M= 90.05) is slightly below average, but still within a normative range, given that scores are standardised at population mean of 100 (SD= 15). However, considerable variation is observed across participants (SD= 13.74), with the lowest score being 69, indicating an extremely low adaptive behaviour in the Practical Domain, and the highest being 120, indicating an above average adaptive functioning in this area.

The mean of the Socialisation scaled scores (M= 6.650) falls below the normative average of 10 and lies at the borderline between the low and normative ranges, considering that the normative standard deviation is 3. Moreover, the variability is relatively limited (SD= 1.834), with scaled scores ranging between 4 and 11, indicating a somewhat coherent picture of socio-relational abilities across participants, clustered in the lower half of the scale.

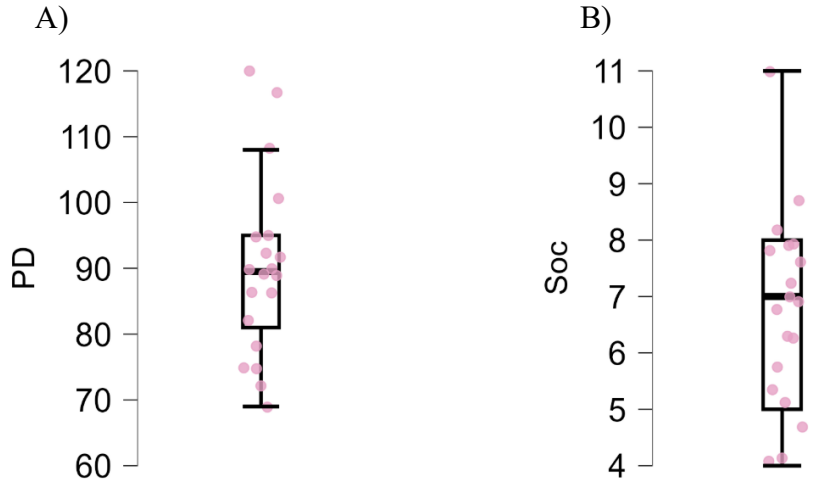


Figure 4.7.: Panel A, Panel B. Scatterplots and boxplots of the distribution of, respectively, the Practical Domain (PD) and Socialisation area (Soc) of the ABAS-II

Panel A and Panel B in Figure 4.7. show scatterplots and boxplots for the Practical Domain (PD) and for the adaptive area of Socialisation (Soc) of the ABAS-II, and the distribution of each participant score on these subscales.

The results are displayed in two distinct graphs, since one measure is a composite score, obtained from the sum of a number of adaptive areas scaled scores, and the other represents a single adaptive area, meaning they are measured on different scales. The y-axis in Panel A displays composite scores of practical adaptive behaviour, which can range from 40 up to 120, with the sample's scores spanning approximately the interval from 70 to 120; meanwhile, the y-axis in Panel B presents scaled scores on the Socialisation area on a range between 4 and 11.

In the graph for the Practical Domain scores, it can be observed that the median is about 90, and the interquartile range goes form approximately 80 to about 95. Scores on this domain are quite inhomogeneous, but the majority of them falls below the normative mean of 100, excluding a small number of outliers. Meanwhile, the graph for the Socialisation area displays a median of about 7, with the interquartile range going from 5 to 8. Overall, scores on this subscale, which has a maximum possible score of 20, have a lower variability, with the majority of scores falling below 9.

4.4. Experimental tests: correlation analysis

In the following paragraph, the results of the correlation analyses will be presented. The *Pearson's r* correlation coefficient is a statistical measure describing the strength and direction of the linear relationship between two variables. Its value ranges from -1 to +1: the closer the value is to +1, the stronger the positive correlation, meaning that as one variable increases, the other tends to increase as well; conversely, the closer the value is to -1, the stronger the negative correlation, meaning that as one variable increases, the other tends to decrease. Values close to 0 indicate a weak correlation, while a value of 0 represents the absence of a linear correlation between two variables (Schober et al., 2018).

The correlation analyses are presented below according to the main constructs examined in the study. Specifically, the section first examines the degree of association between different measures of depression, including self-report and parent-report measures; it then reports the associations between depression measures and perceived social support; finally, it presents the correlations between depression measures and parent-reported adaptive behaviour.

4.4.1. Correlation between different measures of depression

	ADAT-A
PHQ-9 self-report	.706**

Table 4.8. Correlation analysis between ADAT-A and PHQ-9 self-report

Note: * The correlation is significative for p< .05; ** Correlation is significative for p< .01.

Table 4.8. shows the correlation between the ADAT-A and self-report PHQ-9 scores, enabling an assessment, to some extent, of the validity of these questionnaires in measuring depressive symptomatology. As displayed in the table, the two measures present a statistically significant positive correlation (=.709**).

	Self-report	
	PHQ-9 self-report	ADAT-A
Parent-report (PHQ-9)	.352	.435

Table 4.9. Correlation analysis between self- and parent-report measures of depression

Note: * The correlation is significative for p< .05; ** Correlation is significative for p< .01.

Correlations between parent-report and self-report measures of depression are shown in Table 4.9. The scores from the parent-report version of the PHQ-9 do not display statistically significant correlations with either the self-report version of the same questionnaire or the ADAT-A questionnaire. In fact, the parent-report measure does have medium-strength positive correlations with both the self-report version of the PHQ-9 (r= .352), and the total ADAT-A score (r= .435), but they do not reach statistical significance, probably due to the limited sample size used in the current study.

4.4.2. Correlation between depression measures and perceived social support

	MSPSS			
ADAT-A	Other	Family	Friends	Total
Cognitive-Affective	.077	.029	-.302	-.097
Somatic	-.108	-.330	.105	-.155
Autism-specific	-.213	-.153	.145	-.105

Total	-.146	-.241	.049	-.159

Table 4.10. Correlation analysis between ADAT-A and MSPSS

Note: * The correlation is significative for p< .05; ** Correlation is significative for p< .01.

As can be observed from Table 4.10., there are no statistically significant correlations between either the total score or the single domains of the MSPSS and the ADAT-A total score or its subscales. However, it is important to note that some negative correlations of medium strength are present, including the correlation between the somatic subscale of ADAT-A and the Family domain of the MSPSS (r= -.330), as well as the correlation between the Cognitive-Affective subscale and the Friends domain of the MSPSS (r= -.302). These correlations do not reach statistical significance, probably due to the limited statistical power associated to the small sample size.

	MSPSS			
PHQ-9	Family	Friends	Other	Total
Self-report	-.081	.177	.034	.064
Parent-report	-.386	.127	-.603**	-.385

Table 4.11. Correlation analysis between self- and parent-report PHQ-9 and MSPSS

Note: * The correlation is significative for p< .05; ** Correlation is significative for p< .01.

Table 4.11. shows that the correlation between the parent-report version of the PHQ-9 and the Other subscale of the MSPSS is statistically significant and negative in direction (r= -.603). It is worth noticing that the parent-report measure of depression also shows a medium-strength negative correlation with the Family subscale (r= -.386) and the total score of the MSPSS (r= -.385), although not statistically significant probably due to the limitations of the small sample size. By contrast, the self-report version of the PHQ-9 does not show significant, nor strong correlations with any of the MSPSS subscales.

4.4.3. Correlation between depression measures and parent-reported adaptive behaviour

	ABAS-II	
ADAT-A	Practical Domain	Socialisation
Cognitive-Affective	-.064	-.079
Somatic	-.221	-.048
Autism-specific	-.367	-.330
Total	-.320	-.217

Table 4.12. Correlation analysis between ADAT-A and ABAS-II

Note: * The correlation is significative for p< .05; ** Correlation is significative for p< .01.

As shown in Table 4.12., there are no statistically significant correlations between either the total score or the subscales of the ADAT-A and the Practical Domain or Socialisation area of the ABAS-II. Nevertheless, it is interesting to highlight that, although not statistically significant, all correlations are negative, with some reaching medium strength. These include the correlations between both the autism-specific subscale (r= -.367) and the total score (r= -.320) of the ADAT-A and the Practical Domain of the ABAS-II, and the one between the ADAT-A autism-specific domain and the ABAS-II Socialisation area (r= -.330).

	ABAS-II	
PHQ-9	Practical Domain	Socialisation
Self-report	-.457*	-.032
Parent-report	-.530*	-.432

Table 4.13. Correlation analysis between self- and parent-report PHQ-9 and ABAS-II

Note: * The correlation is significative for p< .05; ** Correlation is significative for p< .01.

Table 4.13. displays the correlation analyses between self-report and parent-report PHQ-9 scores and ABAS-II scores. Importantly, the correlation between both self-report (r= -.457) and parent-report (r= -.530) PHQ-9 scores and the Practical Domain of the ABAS-II are negative and statistically significant. Meanwhile, the correlation between PHQ-9 measures and the ABAS-II Socialisation area, although negative as well, are not

statistically significant. However, it is important to note that the correlation between the parent-report PHQ-9 scores and the Socialisation area scores can be considered medium strength (r= -.432) but fails to reach statistical significance, probably because of the limited statistical power associated with the small sample used in the present study.

Chapter 5

Discussion, limitations and future directions

5.1. Discussion

This chapter critically discusses the findings obtained from the analyses of depressive symptoms, perceived social support and adaptive behaviour data.

The study aimed to examine the associations between depressive symptoms and perceived social support, as well as between depressive symptoms and parent-reported adaptive behaviour. The tested hypotheses were that higher levels of depressive symptoms would be associated with lower perceived social support and with lower adaptive functioning scores. In addition, the relationship between self-reported and parent-reported measures of depression was investigated, with particular attention to potential discrepancies between the two versions.

The results of the descriptive and correlational analysis conducted on a sample of 20 autistic young adults are presented and interpreted in relation to the study hypotheses. The potential implications of these findings are then examined in order to draw conclusions regarding the relationships among the variables. Finally, the study's limitations and directions for future research are discussed.

5.1.1. Descriptive findings

Descriptive analysis of the experimental variables, namely self- and parent-report depression, perceived social support, and practical and social adaptive behaviour, revealed considerable variability across participants. This finding is not surprising, given the characteristics of the present sample, which consisted of autistic young adults ranging from 18 to 40 years of age, both with and without mild intellectual disability, who may differ considerably in their psychological wellbeing, social resources and everyday functioning. In fact, the wide score ranges and relatively large standard deviations across measures suggest participants varied substantially in their reported depressive symptoms, levels of perceived social support and adaptive functioning, reflecting the diversity of experiences and presentations observed among autistic individuals (Lord et al., 2020).

5.1.2. Parent-report and self-reported depression

Other than showing different and non-concordant correlations with variables of perceived social support and of adaptive functioning, already indicating a misalignment between the two, self-report and parent-report measures of depression were not found to be significantly positively correlated.

The correlations between the parent-report PHQ-9 and both the self-report PHQ-9 and the ADAT-A were positive and of medium strength, but not strong enough to reach statistical significance. Although this may partly reflect the limited statistical power of the small sample size, these findings are consistent with the hypothesis that scores from different informants would not perfectly align.

A lack of strong concordance between measures of depression or similar constructs obtained from different informants has previously been reported in the literature on autistic population (Pearl et al., 2017). This may indicate that existing self-report measures do not fully capture symptoms in autistic adults, perhaps because they were not specifically developed to account for characteristics that may influence how some autistic individuals interpret and report emotional and behavioural difficulties (Cassidy et al., 2018). Alternatively, discrepancies may reflect difficulties for parents in accessing and therefore accurately understanding their sons' or daughters' subjective emotional experiences (Ward et al., 2025), particularly since it is not uncommon for autistic individuals to face difficulties in identifying, describing and communicating emotions (Oakley et al., 2022). However, findings are not fully consistent regarding the relative value of informant versus self-report data. For example, in contrast with evidence suggesting that existing self-report measures may not fully capture depressive symptoms in autistic adults (Cassidy et al., 2018), some studies suggest that self-report data from autistic individuals without intellectual disability are valid and clinically informative (Danés et al., 2023; Ozsivadjian et al., 2014).

Nevertheless, the two modes of measurements are not necessarily mutually excluding, as discrepancies may capture different aspects of depressive symptomatology. Parent-report measures may better reflect observable manifestations of depression and related behaviours, while self-report measures may provide greater insight into individuals' internal subjective emotional experiences (Ward et al., 2025). For this reason, including the perspectives of multiple informants might help achieve a more comprehensive assessment (Thomas et al., 2025; Ward et al., 2025).

Generally, depression measures widely accepted by the research community as highly valid and reliable for this population have yet to be identified (Cassidy et al., 2018; Mournet et al., 2025). This may account for inconsistent findings regarding epidemiology and prevalence across studies using different instruments, as well as discrepancies between reports from different informants, as observed in the present study.

Depressive presentations in young adult autistic individuals remain underexplored, including its prevalence, associated factors and possible aetiology. This may partly reflect the lack of consensus regarding which measures most accurately capture depressive symptoms in autistic adults and, consequently, the heterogeneity in findings reported in the literature.

5.1.3. Depression and perceived social support

In order to examine the relationship between depression and perceived social support, scores from questionnaires measuring depressive symptoms were analysed in association with scores from the MSPSS questionnaire.

First of all, correlational analysis between total self-report scores from the ADAT-A questionnaire and total scores from the MSPSS showed no significant association between the two scales. Similarly, none of the ADAT-A subscales, including the Cognitive-Affective symptoms, Somatic symptoms and autism-specific symptoms subscales, showed statistically significant correlations with any of the MSPSS subscales, including the Other, Friends and Family domains. Although the correlation between somatic symptoms and the MSPSS Family subscale and the one between Cognitive-Affective symptoms and the MSPSS Friends domain could be considered of medium strength, it is not possible to conclude that a meaningful relationship between these two measures exists. This is not in line with the expectation that higher perceived social support would be associated with lower levels of self-report depression (Gotham et al., 2014; Smith & White, 2020). The strength of the correlations between the PHQ-9 depression measure and all the MSPSS subscales of perceived social support led to the same conclusion.

Conversely, the parent-report scores on the PHQ-9 did show a statistically significant negative correlation with the MSPSS Other subscale, as well as medium-strength, although not statistically significant, negative correlations with the Family subscale and the total score. This means that higher depressive symptoms as assessed by parents of autistic young adults were associated with lower levels of perceived social support from participants. However, strong conclusions on the measure of perceived social support as a whole cannot be drawn. Most saliently, it can be said that perceived support from significant others within this sample was strongly associated with depressive symptoms as reported by parents.

These results only partially support the hypothesis that depression scores would negatively correlate with perceived social support, as observed in the general population (Gariépy et al., 2016; Yeo, 2025) and reported by some studies in autistic populations (Gotham, 2014; Smith & White, 2020). The present findings are indeed congruent with the fact that there is some degree of inconsistency in the literature, with weaker or less consistent associations also being reported (Alvarez-Fernandez et al., 2017; Hedley et al., 2017). Therefore, it is challenging to formulate a strongly supported hypothesis on the strength and direction of the relationship.

The absence of significant correlations between self-report measures of depression and MSPSS in the present study, considered alongside the substantial heterogeneity of findings reported in the literature (Alvarez-Fernandez et al., 2017; Gotham et al., 2014), may indicate that the relationship between perceived social support and mental well-being is more variable in autistic adults than in neurotypical adults, where findings have generally been consistent (Yeo et al., 2025). Alternatively, aspects of interpersonal relationships that are most relevant to autistic individuals may not be fully captured by the MSPSS. These interpretations highlight the importance of taking into account the specific needs of autistic individuals, and the aspects of social relationships that they perceive as most meaningful, when developing intervention plans.

Conversely, the statistically significant negative correlation between parent-report PHQ-9 depression scores and MSPSS scores is in line with patterns observed in the general population (Gariépy et al., 2016), along with some studies conducted on autistic samples (Gotham, 2014; Smith & White, 2020), linking perceptions of social support to mental

health. More specifically, the Other subscale was the only statistically significant MSPSS subscale correlated with parent-reported depression. This could reflect the importance that many autistic young adults place on finding a life partner or, more generally, establishing intimate connections, despite the potential barriers experienced in initiating and maintaining them (Hancock et al., 2020), perhaps exacerbated by social comparison with same-aged peers. This experience might indeed be particularly common among autistic young adults without intellectual disability, who constitute the vast majority of the sample used in the present study, and who may be more aware of social and interpersonal differences between themselves and their peers (Sterling et al., 2008).

For the purposes of this discussion, it is particularly relevant to focus on discrepancies in the results across informants.

Most of the literature exploring depression, perceived social support or the relationship between the two in this population has used a single measurement, usually self-report, for both variables (Alvarez-Fernandez et al., 2017; Hedley et al., 2017; 2018). However, the authors of these studies have pointed out that the use of self-report measures alone for depressive symptom assessment may not be sufficient, suggesting the inclusion of multiple informants in order to obtain a more comprehensive picture. In the present study, correlations between depression and perceived social support appear to vary according to the informant, since they do not reach significance for self-report depression, whereas they do for parent-report depression. This may suggest that including multiple informants contributed to a more detailed understanding of the associations between these two variables, revealing a specific association between perceived lack of support from a significant other and higher levels of depression. This, as already highlighted, may be in line with young autistic adult's desire of establishing intimate relationships but difficulties in doing so (Hancock et al., 2020). However, it may also be true that this result, given that it was not replicated using self-report depression measurements, reflects limitations in parent ratings, as parents may have difficulties accurately capturing their son or daughter's internal emotional experiences (Ward et al., 2025).

Overall, findings only partially supported the hypothesis that depressive symptoms would be negatively correlated with perceived social support. Specifically, only perceived

support from a significant other was associated with depression levels reported by participants' parents. It is particularly relevant to focus on the differences between results involving self-report and those involving parent-report measures of depression, which suggest that the relationship between depressive symptomatology and perceived social support varies depending on the informant. Taken together, the findings presented in this section suggest that associations between depression and perceived social support in this population may be more complex than initially hypothesised.

5.1.4. Depression and adaptive functioning

The current study additionally aimed to examine the relationship between depressive symptoms and adaptive behaviour. For this reason, correlations between depression questionnaire scores and the ABAS-II scores assessing practical and social dimensions of adaptive behaviour were computed and interpreted.

The total ADAT-A score showed a moderate correlation with the ABAS-II practical domain, as did the autism-specific depressive symptoms subscale. Moreover, the latter also showed a moderate correlation with the socialisation area of the ABAS-II. All correlations were negative in direction and were generally stronger for the practical domain than for the socialisation area. However, these results cannot be used to draw firm conclusions about the relationship between depression levels and adaptive behaviour in the participants, since no statistically significant correlations were found between ADAT-A total scores or its subscales, including the Cognitive-Affective, Somatic and autism-specific subscales, and either the practical domain or the socialisation area of the ABAS-II.

In contrast, the self-report version of the PHQ-9 showed a somewhat different pattern of association with ABAS-II measures: relationships with both the practical domain and the socialisation area of the ABAS-II were also negative, but while the correlation with the latter was small and non-significant, the negative correlation with the practical domain was statistically significant.

Parent-report PHQ-9 scores showed a similar pattern, including a strong and statistically significant negative correlation with the ABAS-II practical domain and a medium-strength, but not statistically significant, correlation with the socialisation area.

All in all, higher PHQ-9 depression scores, as reported both by participants themselves and by their parents, were associated with lower levels of practical adaptive functioning, as measured by the corresponding ABAS-II domain. Meanwhile, the socialisation area did not appear to be clearly related to self-report PHQ-9 scores, and no strong conclusions can be drawn regarding its association with the parent-reported symptoms.

The present results partially support the exploratory hypothesis that higher depression scores would be associated with lower practical and social adaptive functioning (Kraper et al., 2017; Zukerman et al., 2019). In fact, the two self-report measures yielded only partially consistent findings. Although they both negatively correlated with adaptive functioning and, more strikingly, with practical adaptive behaviour, statistically significant results emerged only between the self-report PHQ-9 and the practical domain. Correlations involving parent-report PHQ-9 scores appear to be consistent with the self-report version of the same questionnaire, particularly regarding the association with the ABAS-II practical domain scores, for which both measures showed correlations of comparable magnitude. By contrast, while correlations involving the socialisation area did not reach statistical significance for both PHQ-9 versions, this domain appeared to be much more strongly associated with the parent-report version.

The heterogeneity of the correlational findings mirrors the inconsistency reported in the literature and reflects the complexity of issues surrounding psychiatric comorbidity and adaptive functioning in autistic populations. Discrepancies in findings between and within studies may partly reflect the use of different measures to assess depressive symptoms in autistic populations, an issue highlighted by research examining the validity and concordance of commonly used assessment tools (Cassidy et al., 2018; Mournet et al., 2025). However, practical domain scores were consistently associated with depressive scores, at least from two of the three depression measures used, suggesting that difficulties in daily living skills, including those related to community use, self-care, home living and health and safety, may be linked to lower mood and increased internalising symptoms, regardless of the direction of the association. Meanwhile, socialisation skills did not show a similarly consistent relationship with co-occurring depression, highlighting the possibility that factors associated with mental wellbeing in the general population might not be as relevant for autistic young adults.

However, research exploring the relative importance of daily living practical skills and socialisation skills for the mental wellbeing of autistic individuals remains limited, and these interpretations should therefore be considered speculative.

Young adults may face new and increasingly complex challenges related to autonomy and expectations regarding the development of daily living skills (Sterling et al., 2008), perhaps particularly so among those without an intellectual disability, who constitute the vast majority of this sample. This may make the relationship between adaptive behaviour and potential psychiatric comorbidities especially relevant in this population.

To conclude, findings partially supported the hypothesis that depression would be negatively associated with adaptive behaviour, although substantial variability emerged across the different depression measures used. Nevertheless, evidence of an association between practical adaptive behaviour and depressive symptoms was found, suggesting that difficulties in community use, self-care, home living and health and safety may contribute to, or be exacerbated by, depressive symptoms. Although these findings point to a stronger relationship between depression and practical adaptive functioning than between depression and adaptive social skills, variability across depression measures complicates the interpretation of results.

5.2. Limitations and future directions

Even though the present study offers a number of insights into depression and its relationship with perceived social support and adaptive behaviour in autistic young adults, it does have important limitations.

First of all, the sample used in this study is relatively small, which limited the statistical power of the study. This means that correlations of medium magnitude did not reach statistical significance, and that relatively large correlation coefficients were required to achieve statistical significance. Moreover, due to the small sample size it was not possible to compute more elaborate statistical analyses and therefore explore, for example, the directionality of associations or potential causal relationships in greater depth, which is why more advanced hypotheses were not devised. Additionally, analysing depression, perceived social support and adaptive behaviour on such a small number of participants

does not allow findings regarding the relationships among these variables to be reliably generalised to the clinical population of autistic young adults. For this reason, it is advisable that future research aimed at deepening the study of these topics and performing more sophisticated statistical analyses on the autistic population be conducted on a larger sample.

An additional limitation of the present study concerns the gender imbalance in the sample, with 18 males and only 2 females. This reflects common recruitment challenges in autism research and, to some extent, the higher prevalence rates generally reported among males, regardless of whether these differences reflect a genuinely lower prevalence among females or their underdiagnosis. The current study's results may therefore not fully capture the experience of young adult autistic females and not be generalisable to this population, making it necessary for future studies to include a greater representation of females whenever possible.

While it is true that the inclusion of both self-report and parent-report measures of depression can be potential strength of the study, since it may help capture different aspects of depressive presentations, discrepancies between informants also introduce additional variability. This may be particularly problematic in studies with small samples, where statistical power is already limited and variability may have a greater influence on the final results. This represents another reason why future research using different informants to assess depression in autistic samples should aim to recruit larger numbers of participants. Moreover, while it may be helpful to include different measures of the same construct from the same informant, the ADAT-A, being designed specifically for autistic adults without intellectual disability and not administered to participants with such a diagnosis, may reduce the comparability of depressive symptom assessments across the full sample. Even though participants with mild intellectual disability represent only a small proportion of the sample, it is important to highlight that research including participants with different levels of cognitive ability should pay particular attention to the sustainability and comparability of the measurement tools employed.

Moreover, the current study has a cross-sectional design, measuring depression, perceived social support and adaptive behaviour at only one point in time, which makes it difficult to test hypotheses regarding causality and more nuanced mechanisms underlying the association between these variables. Longitudinal research is therefore needed to allow a more precise determination of the directionality of these associations and their evolution over time.

Finally, assessment and classification of participants' intellectual functioning represent an additional limitation of the study. In fact, access to comprehensive and recent clinical documentation regarding participants' cognitive profiles, which was important for screening and categorisation based on the presence or absence of mild intellectual disability, was not always available. In some cases, assessments of cognitive functioning reported in clinical records differed from estimates obtained during the study screening procedure through WAIS-IV. These discrepancies may have affected the precision of participant categorisation according to the presence or absence of mild intellectual disability, potentially impacting the accuracy of questionnaire completion and limiting the ability to account for heterogeneity in cognitive functioning within the sample. Future studies on this topic should more carefully assess cognitive functioning through updated reports and standardised measures in order to ensure an accurate screening and classification of participants.

5.3. Conclusion

Despite its limitations, the current study provides an interesting perspective regarding co-occurring depressive psychopathology in a sample of autistic young adults and its relationship with social and behavioural factors. Perceived social support and practical and social adaptive functioning are indeed recognised in the general population as fundamental factors shaping individuals' mental health and overall wellbeing.

The results highlight the complex nature of these associations in autistic young adults, with only some dimensions of each measure correlating significantly with depression, sometimes depending on the informant considered. Most saliently, perception of social support from a significant other was associated with depressive symptoms when depression was assessed through parent-report measures. As for adaptive functioning, the

practical domain showed a more consistent pattern of correlation with depressive symptomatology across different informants than socialisation skills, which were less strongly associated with depression. These findings suggest that different sources of perceived social support and different dimensions of adaptive functioning may have distinct relationships with depression in autistic young adults, and that these relationships may vary according to the measurement approach and informant used. The discrepancies observed between self-report and parent-report measures of depression further emphasise the importance of using multiple-informant assessments in research investigating internalising symptoms and related factors, in order to try and gather different perspectives on autistic individuals' emotional experiences and challenges.

Overall, the findings of this study contribute to the growing literature highlighting the heterogeneity of depression presentations in autism and the ongoing challenges associated with reaching consensus on the most appropriate methods for their assessment.

Finally, carefully designed studies with larger representative samples exploring depression and possible related factors, such as perceived social support and adaptive functioning, in autistic young adults, along with further investigation of the validity and reliability of depression assessment measures, are fundamental in order to achieve a clearer picture of the prevalence and aetiology of this comorbidity. Such research may help improve understanding of a condition that can represent a significant burden for autistic individuals during the delicate phase that is the transition to adulthood.

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