

**Positive Psychology in Neurodiversity: An Investigation of Character Strengths in Autistic Adults in the  
United Kingdom in a Community Setting**

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**Author Note**

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## **Abstract**

### **Background**

The positive psychology and neurodiversity movements both aim to promote and improve wellbeing through strengths-based approaches. However, little is known about how positive psychology can support the wellbeing of autistic people. The present study investigated character strengths profiles as a potential tool to identify strengths-based interventions that could enhance wellbeing outcomes for autistic adults. To our knowledge, this is first study to use this method as a possible way of improving the wellbeing of autistic adults in the community in the UK.

### **Method**

Forty-seven self-reported formally diagnosed (83%) and self-identifying (17%) autistic adults completed online self-rated standardised questionnaires about their character strengths and life satisfaction. Descriptive statistics and correlational analyses were used to evaluate the profile of character strengths and their relationship to overall life satisfaction

### **Results**

Character strengths most frequently reported by autistic adults were *Honesty, Appreciation of Beauty and Excellence, Love of Learning, Fairness and Kindness*. Higher levels of life satisfaction were associated with character strengths of *Gratitude, Hope and Honesty*.

### **Conclusions**

The most frequent character strengths were consistent with autistic traits reported in the wider body of autism literature, such as intense interests and strong attention to detail. The present study provides preliminary findings and recommendations for potential future strengths-based interventions that could enhance life satisfaction of autistic adults in a community setting. Further investigation with larger samples is needed to replicate the emerging findings on this topic.

*Keywords:* Autistic adults; Autism spectrum; Character strengths; Positive Psychology; Strengths-based Interventions; Satisfaction with Life

## Introduction

Autism is a lifelong neurodevelopmental condition that occurs in more than 1 in 66 people (Lord et al., 2020; NICE, 2020). Autism is characterised by a specific yet neurodiverse spectrum of characteristics that include differences in social communication and social interactions and a strong need for routine and sameness. These traits are often associated with differences in information processing and thinking and specific patterns of interests and sensory sensitivities that can present as strengths or difficulties in everyday life (American Psychiatric Association, 2013; Lord et al., 2018). The science of *Positive Psychology* originated with the intention of shifting the balance of psychological research to also focus on “building positive qualities” and not solely highlighting impairments (Seligman & Csikszentmihalyi, 2000, p. 5). Similarly, the *neurodiversity movement* (Sinclair, 1993; Singer, 1999) has called for the use of strengths-based approaches to ameliorate challenges of those living with a neurodevelopmental disability (den Houting, 2019; Donaldson et al., 2017; Savarese, 2009).

Despite the similar philosophies of positive psychology and the neurodiversity movement, the literature relating to a strengths-based approach in people with disabilities is scarce (e.g., Shogren, 2013). Nevertheless, positive psychology research in clinical populations is emerging. For example, the *Positive Psychotherapy* programme (Rashid, 2015; Seligman et al., 2006) was applied in a range of conditions including major depression (Seligman et al., 2006) and schizophrenia (Meyer et al., 2012). In the context of autism, this development is important since mental health problems are common (38-79%) in autistic people (Lever & Geurts, 2016; Uljarević et al., 2020). The present study aimed to reduce the gap in the existing positive psychology research with autistic adults by investigating character strengths and their association with life satisfaction in the autistic community in the UK.

### **Building on character strengths to promote wellbeing**

The study of character strengths, refers to personality traits that are core to a person's identity and conduct (see e.g., Niemiec, 2013, 2018; Umucu et al., 2022), has received significant consideration within the field of positive psychology. Character strengths are positively linked to multiple dimensions and models of wellbeing, including Seligman's (2011) PERMA dimensions of wellbeing (Niemiec, 2018, p. 14) and goal attainment (Linley et al., 2010). The most researched area is the use of interventions related to *signature strengths* (the five top-ranked strengths). The use of signature character strengths in a new way was reported to improve happiness and reduce depression levels in general populations comprising students, employees and people in community settings (for a meta-analysis, see Schutte & Malouff, 2019). Another well-researched area focuses on identifying specific character strengths that have the potential to improve life satisfaction. Several studies found that strengths of *Hope, Zest, Gratitude, Love* and *Curiosity* are strongly associated with life satisfaction (Park et al., 2004; Peterson et al., 2007; Proyer et al., 2013), although age-related (Kretzschmar et al., 2022) and cultural differences exist (Littman-Ovadia & Lavy, 2012; Peterson et al., 2007).

Research and applications of character strengths extends to wide-ranging contexts and populations, such as business, education, health, stress management and relationships (Niemiec & Pearce, 2021). Recent research efforts include studies focusing specifically on individuals with intellectual and developmental disabilities (for an overview, see Niemiec et al., 2017). A recent large-scale international study on character strengths in people with disabilities reported that *Love of Learning, Honesty, Appreciation of Beauty and Excellence, Kindness, and Fairness* were most endorsed by disabled people (Umucu et al., 2022). Autism-specific studies found positive personal qualities in adults to include honesty and empathy (Cope & Remington, 2022; Russell et al., 2019) and strong sense of justice (Cope & Remington, 2022), as well as love, happiness and kindness in autistic children (Clark & Adams, 2020; Cost et al., 2021). However, at the time of the present study, to our knowledge only two

other studies (Kirchner et al., 2016; Samson & Antonelli, 2013) explored the endorsement of character strengths of individuals on the autism spectrum using a validated positive psychology-based measure. The findings of the two studies indicated that the *signature strengths* of autistic adults were largely intellectually-driven (e.g., *Judgement* and *Love of Learning*) and were consistent with characteristic autistic traits, such as intense interests and strong attention to detail (see e.g. Bury et al., 2020). In addition, the two studies found that the use of interpersonal (e.g., *Teamwork*, *Forgiveness*) and emotional strengths (e.g., *Social Intelligence*, *Humour*) tended to be under-utilised compared to non-autistic adults. Regarding character strengths that are related to life satisfaction, Samson and Antonelli (2013) found that only *Hope* was linked to life satisfaction in autistic adults, whereas Kirchner et al. (2016) reported a significant association between life satisfaction and six strengths (*Hope*, *Zest*, *Kindness*, *Humour*, *Social Intelligence*, *Teamwork*), all of which were categorised as emotional or interpersonal. However, these studies were conducted in German-speaking countries and it is known that the endorsement of character strengths varies across cultures (Biswas-Diener, 2006). Therefore, those findings may not be generalisable to autistic adults in the United Kingdom.

### **The present study**

Despite the parallels between the positive psychology and neurodiversity movements and their focus on strengths-based approaches, there is still little knowledge of the cultural relevance and potential benefits of character strengths knowledge and application on wellbeing for autistic people in the UK community. Accordingly, the main aims of the present paper were to investigate (i) the endorsement of character strengths and their congruence with characteristic autistic traits and (ii) the association between characters strengths and life satisfaction in autistic adults in a community setting in the United Kingdom. Based on previous literature of applied positive psychology in autism, we hypothesised that:

**Hypothesis 1:** The *signature strengths* in autistic adults would consist largely of intellectual strengths congruent with characteristic autistic traits, whilst interpersonal and emotional strengths, would be least endorsed (Kirchner et al., 2016; Samson & Antonelli, 2013);

**Hypothesis 2:** Life satisfaction would be positively associated with the strength of *Hope*. No assumptions were made about other character strengths, as previous findings were inconsistent (Kirchner et al., 2016; Samson & Antonelli, 2013).

## Method

### Design

This cross-sectional study used descriptive statistics and correlational analyses to answer the research questions.

### Ethics

Ethical approval was obtained from the University of East London School of Psychology Research Ethics Committee in May 2021. The study was conducted in accordance with procedures and guidelines set out in the *Declaration of Helsinki* (2000).

### Participants

Forty-seven autistic adults (aged 18-75 years) took part in an online-based study (see Table 1 for demographic data). Participants were mostly white ( $n = 43$ , 91.5%), female ( $n = 31$ , 66.0%) and educated to degree level ( $n = 35$ , 74.5%). The study attracted markedly more women than men, congruent with the finding that women are more likely to respond to online survey requests, particularly in the autistic community (e.g., Belcher et al., 2022). Thirty-nine participants (83.0%) self-reported that they had a formal autism diagnosis (such as the autism spectrum condition, Asperger's syndrome or similar) from a trained medical professional and 8 participants (17%) self-identified as autistic. Individuals without a formal diagnosis were not excluded from the study to include participation of all who identified with autism-related profiles but have yet to receive a formal diagnosis (as in other studies, e.g., Botha &

Frost, 2020; Kapp et al., 2013). No additional information on co-occurring conditions or disabilities was collected, as these were not variables of investigation in the present study. Of the 45 participants who provided the age of diagnosis or self-identification, the majority were late discovered ( $M = 37.47$ ,  $SD = 14.94$ ). Verification of clinical diagnosis by assessment of autistic traits was not carried out as the study was conducted entirely online during the COVID-19 pandemic.

The study was advertised through autism charities and community groups in the UK and autism-related social media forums and groups that include autistic adults, including those who identify as autistic but who have not yet received a formal diagnosis. A sample size of 45-48 was sought to achieve an effect size of  $\sim 0.4$  for correlations with  $\alpha$  of 0.05 and power of 0.80, as calculated using the *GPower* software (Faul et al., 2007). Participation was restricted to those living in the United Kingdom in an attempt to limit cultural variations in the endorsement of character strengths (Biswas-Diener, 2006). No monetary incentive was offered for taking part, but participants who completed all study tasks were provided with a personalised report of their strengths.

**Table 1**

*Demographic characteristics of the participants, n = 47*

Characteristics	n	%
Age		
18-25	8	17.0%
26-35	10	21.3%
36-45	9	19.1%
46-55	14	29.8%
56-65	5	10.6%
66-75	1	2.1%
Diagnosis type		
Formal	39	83.0%
Self-identified	8	17.0%
Age at diagnosis <sup>a</sup> , mean $\pm$ SD	37.47 $\pm$ 14.94	
Gender		
Male	8	17.0%
Female	31	66.0%
Transgender, Non-binary or Gender-fluid	6	12.8%

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Other (not stated above)	2	4.3%
Ethnic background		
Black	1	2.1%
Mixed	2	4.3%
White	43	91.5%
Other (not stated above)	1	2.1%
Education level		
GCSE	1	2.1%
A-levels	7	14.9%
Vocational qualifications such as NVQ	4	8.5%
Undergraduate degree	20	42.6%
Master's degree	15	31.9%
Employment status		
Employed part-time	5	10.6%
Employed full-time	11	23.4%
Self-employed (own business)	9	19.1%
Student	11	23.4%
Retired	2	4.3%
Not currently in paid employment	9	19.1%

Note. a Age at diagnosis was missing for 2 participants. SD = standard deviation, GCSE = General Certificate of Secondary Education, NVQ = national vocational qualification

**Measures**

The *Values In Action (VIA) Inventory of Strengths-P* (VIA-IS[-P], McGrath, 2019) is a 96 item self-report assessing character strengths. Items (e.g., “I am always coming up with new ways to do things”) are assessed on a 5-point Likert scale (1 = *Very Much Unlike Me*, 5 = *Very Much Like Me*) and only include questions in the positive direction. Responses are averaged across the respective items to generate scores for each of the 24 character strengths (using four items per strength) and, by averaging further, five *strength factors* or categories (Ruch et al., 2010), which include categories such as *emotional* and *interpersonal* strengths (see Table 2). In the present study, the alpha coefficient of the VIA-IS across strengths was in the range of .59 to .92 (mean  $\alpha = .74$ ). The Shapiro-Wilk test indicated that nine out of 24 character strengths were not normally distributed,  $W(47) = 0.900$  to  $0.948$ ,  $p = .001$  to  $.035$ .

**Table 2**



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*The VIA Classification of 24 Character Strengths (McGrath, 2019) and Strength Factors (Ruch et al., 2010)*

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<b>Emotional Strengths</b>	
Zest	Approaching life with excitement and energy; not doing things halfway or half-heartedly; living life as an adventure; feeling alive and activated
Hope	Expecting the best in the future and working to achieve it; believing that a good future is something that can be brought about
Bravery	Not shrinking from threat, challenge, difficulty, or pain; speaking up for what's right even if there's opposition; acting on convictions even if unpopular; includes physical bravery but is not limited to it
Humour	Liking to laugh and tease; bringing smiles to other people; seeing the light side; making (not necessarily telling) jokes
Love	Valuing close relations with others; in particular, those in which sharing and caring are reciprocated; being close to people
Social Intelligence	Being aware of the motives/feelings of others and oneself; knowing what to do to fit into different social situations; knowing what makes other people tick

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<b>Interpersonal Strengths</b>	
Kindness	Doing favours and good deeds for others; helping them; taking care of them
Teamwork	Working well as a member of a group or team; being loyal to the group; doing one's share
Fairness	Treating all people the same according to notions of fairness & justice; not letting feelings bias decisions about others; giving everyone a fair chance
Leadership	Encouraging a group of which one is a member to get things done and at the same time maintain good relations within the group; organizing group activities and seeing that they happen
Forgiveness	Forgiving those who have done wrong; accepting others' shortcomings; giving people a second chance; not being vengeful
Humility	Not letting one's accomplishments speak for themselves; not regarding oneself as more special than one is

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<b>Intellectual Strengths</b>	
Creativity	Thinking of novel and productive ways to conceptualise and do things; includes artistic achievement but is not limited to it
Curiosity	Taking an interest in ongoing experience for its own sake; finding subjects and topics fascinating; exploring and discovering
Judgement	Thinking things through and examining them from all sides; not jumping to conclusions; being able to change one's mind in light of evidence; weighing all evidence fairly
Love of Learning	Mastering new skills, topics, and bodies of knowledge, whether on one's own or formally; Related to the strength of curiosity but goes beyond it to describe the tendency to add systematically to what one knows

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<b>Strengths of Restraint</b>	
Perseverance	Finishing what one starts; persevering in a course of action in spite of obstacles; "getting it out the door"; taking pleasure in completing tasks
Prudence	Being careful about one's choices; not taking undue risks; not saying or doing things that might later be regretted
Self-regulation	Regulating what one feels and does; being disciplined; controlling one's appetites and emotions

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Perspective	Being able to provide wise counsel to others; having ways of looking at the world that make sense to oneself/others
Honesty	Speaking the truth but more broadly presenting oneself in a genuine way and acting in a sincere way; being without pretence; taking responsibility for one's feelings and actions

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### Theological Strengths

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Spirituality	Having coherent beliefs about the higher purpose and meaning of the universe; knowing where one fits within the larger scheme; having beliefs about the meaning of life that shape conduct and provide comfort
Gratitude	Being aware of and thankful for the good things that happen; taking time to express thanks
Appreciation of Beauty and Excellence	Noticing and appreciating beauty, excellence, and/or skilled performance in various domains of life, from nature to art to mathematics to science to everyday experience

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*Note.* ©Copyright 2004-2022, VIA Institute on Character. Used with permission; all rights reserved. [www.viacharacter.org](http://www.viacharacter.org). Strength descriptions also appeared in Niemiec et al. (2017).

The *Satisfaction with Life Scale* (SWLS, Diener et al., 1985) is a 5-item self-report measuring life satisfaction (global subjective wellbeing). Items, such as “In most ways my life is close to my ideal.”, are measured on a 7-point Likert scale (1 = *Strongly disagree*, 7 = *Strongly agree*). In the present study, the SWLS showed an internal consistency of  $\alpha = .90$ . The Shapiro-Wilk test indicated that the SWLS was not normally distributed,  $W(47) = 0.951, p = .046$ .

### Procedure

Participants who expressed interest in taking part in the study were invited to provide informed consent and complete online questionnaires using Qualtrics software. The information sheet used plain English language and utilised both audio and written formats to convey more complex information. For example, an overview of the topic of this study (i.e., how character strengths are defined within positive psychology) was presented as a video and a downloadable slide pack. Participants then completed demographic information, character strengths profile (VIA-IS), and wellbeing scale (SWLS). They were also asked for an email address, which was required to issue strengths reports.

### Data analysis

Statistical analysis was conducted using *SPSS version 26*. Scales were assessed for internal consistency and normality. Descriptive statistics were reported for the demographic information and character strengths profile. In addition to mean scores for each character strength, ipsative scoring, where the endorsement of each strength is ranked from 1 (top) to 24 (bottom), was produced to reduce the risk of a response bias (Park et al., 2004). Bivariate correlations between the 24 character strengths of the VIA-IS and 5 strengths categories and satisfaction with life were generated using Kendall's tau. This non-parametric method was chosen due to the normality assumptions not being met by all the variables and was chosen over Spearman's rho due to being more robust (Croux & Dehon, 2010). Additionally, the false discovery rate procedure (Benjamini & Hochberg, 1995) was used to account for multiple comparisons being made.

## Results

### Character strengths profile

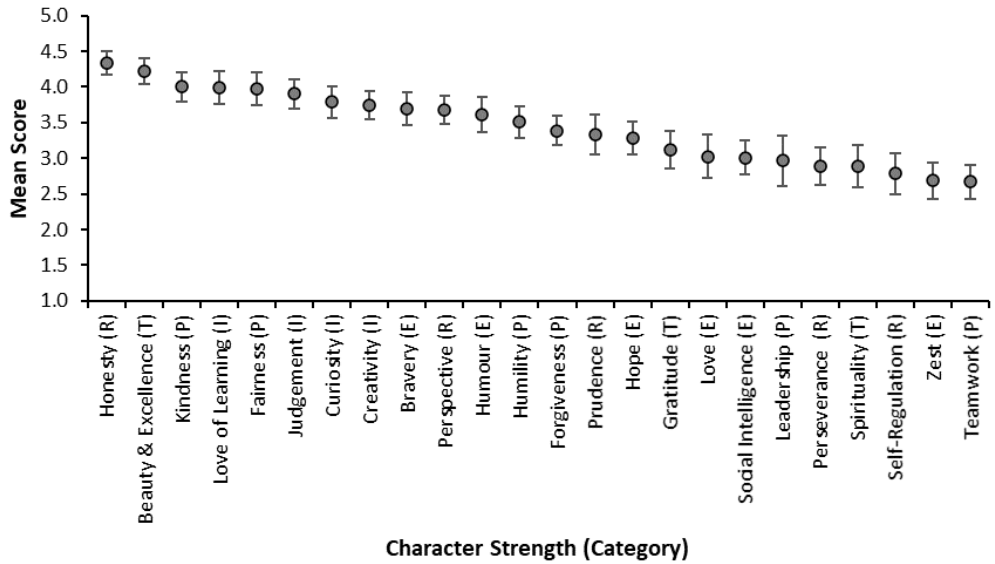
Descriptive statistics for each character strength of the VIA-IS (a profile of 24 character strengths) are set out in Figure 1a and 1b. There was a clear distinction in the relative endorsement of strengths. For example, *Honesty* was the most frequently reported strength ( $M = 4.34$ ,  $SD = 0.57$ ) with 28 participants (59.6%) scoring 4 or more, whereas *Teamwork* ( $M = 2.67$ ,  $SD = 0.82$ ) was rated the least by the overall sample, with 35 participants (74.5%) scoring 3 or less.

Furthermore, descriptive statistics for each character strength cluster are summarised in Figure 2a and 2b. It is evident that *Intellectual* strengths were most frequently endorsed ( $M = 3.86$ ,  $SD = 0.52$ ) whereas *Emotional* strengths were the least reported ( $M = 3.22$ ,  $SD = 0.45$ ). However, the endorsement of *Emotional* strengths did not appear to be different from the *Interpersonal*, *Theological* and *Restraint* strength categories.

### Figure 1a

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Mean and 95% confidence intervals of character strengths, ranked by the mean score (n = 47)

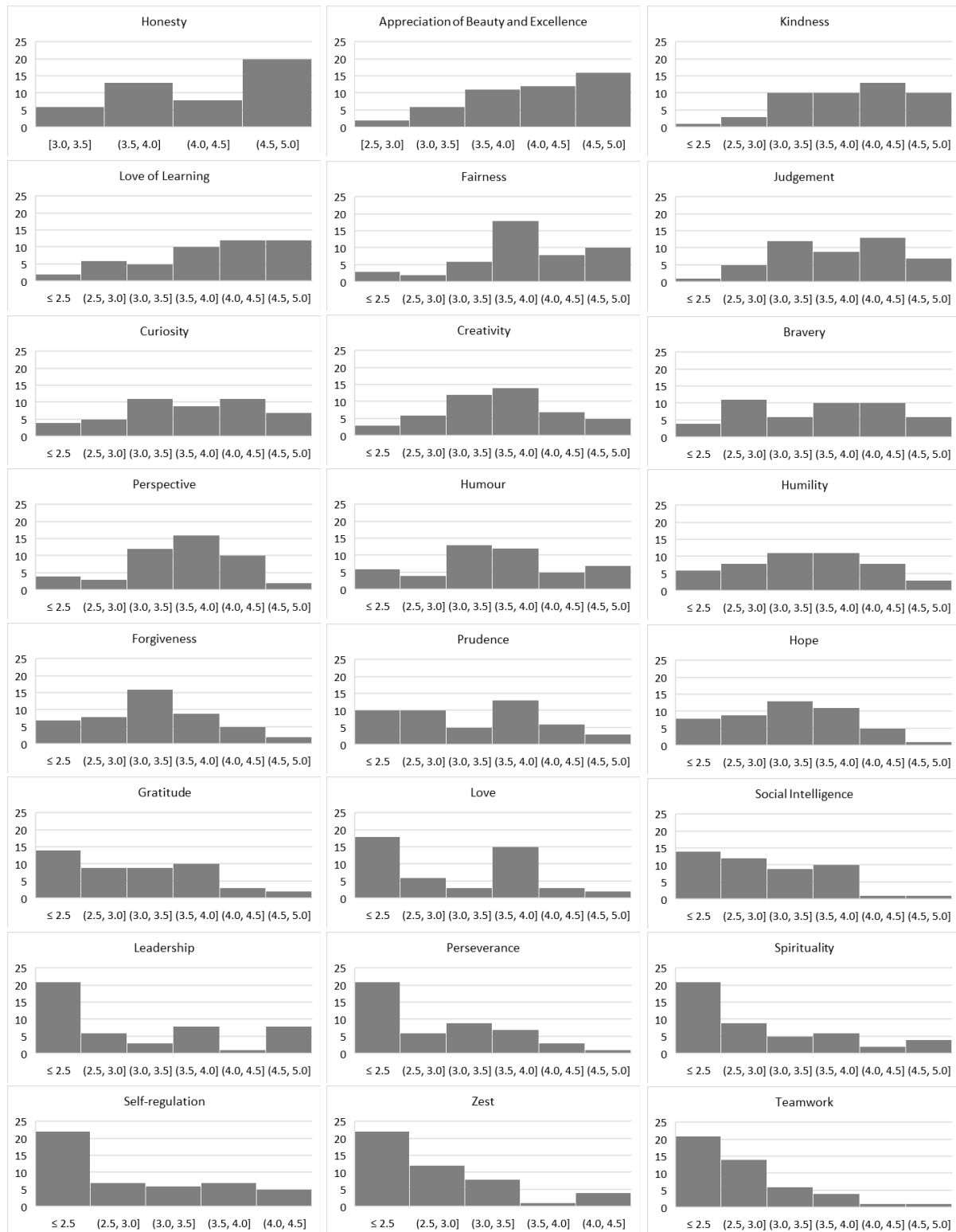


Note. The bars around the mean score represent confidence intervals at the 95% significance level. The abbreviated strength categories are: emotional (E), Intellectual (I), Interpersonal (P), Restraint (R) and Theological (T). Appreciation of Beauty and Excellence is abbreviated to 'Beauty and Excellence'.

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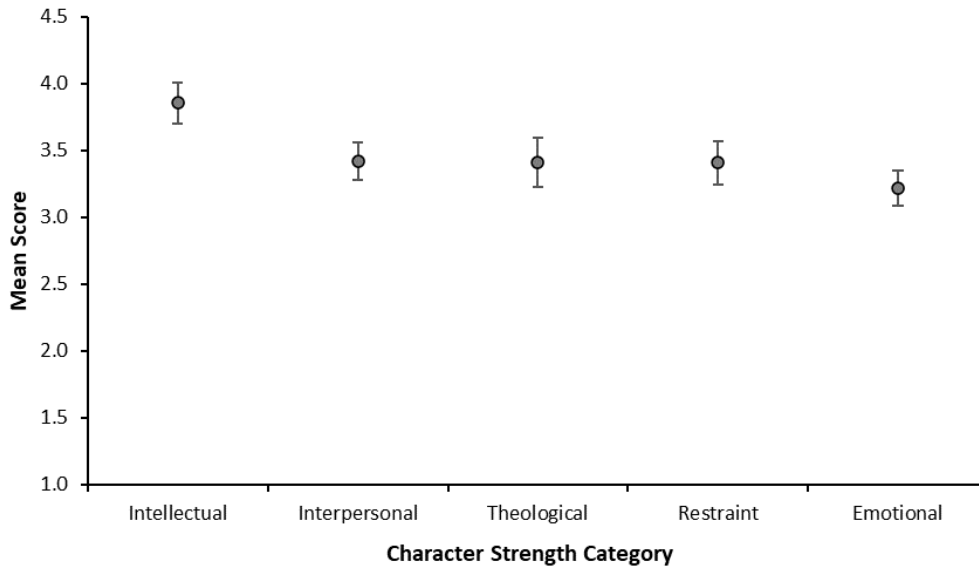
Figure 1b

Histograms of character strengths, sorted by descending mean score (n = 47)



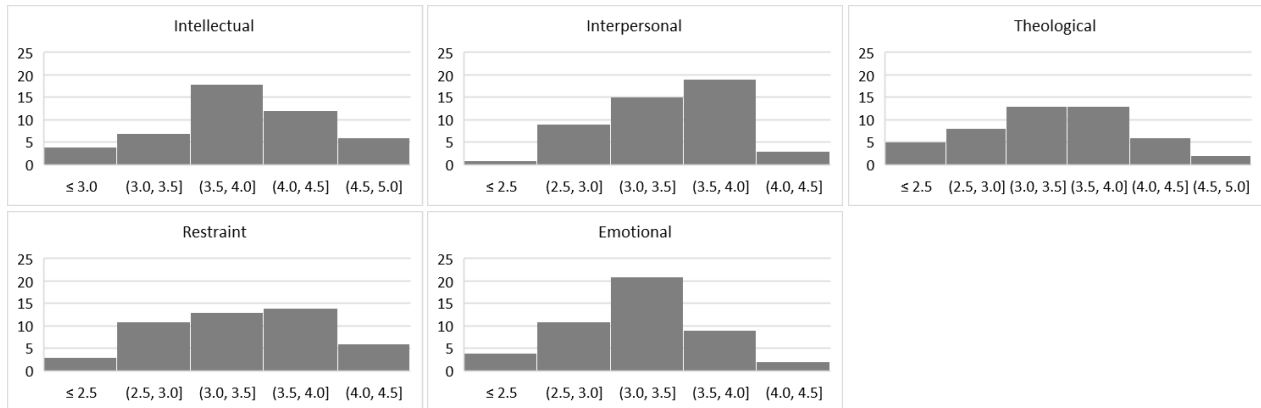
**Figure 2a**

Mean and 95% confidence intervals of character strength categories, ranked by the mean score (n = 47)



**Figure 2b**

Histograms of character strength categories, sorted by descending mean score (n = 47)



Individual character strengths profiles were derived by ranking the mean score for the 24 character strengths, from 1 (most frequent) to 24 (least frequent). To evaluate *signature strengths* (the five top-ranked strengths) for the total sample, character strengths were ranked by the frequency the strength featured as a *signature strength* (see Table 3). For over 50% of the participants, the top five

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reported character strengths (*signature strengths*) were *Honesty* ( $n = 34, 72.3\%$ ), *Appreciation of Beauty and Excellence* ( $n = 30, 63.8\%$ ), *Love of Learning* ( $n = 27, 57.4\%$ ), *Fairness* ( $n = 25, 53.2\%$ ) and *Kindness* ( $n = 24, 51.1\%$ ). By contrast, the least endorsed character strengths were *Gratitude* ( $n = 1, 2.1\%$ ), *Teamwork* ( $n = 2, 4.3\%$ ), *Social Intelligence* ( $n = 2, 4.3\%$ ), *Zest* ( $n = 2, 4.3\%$ ) and *Self-regulation* ( $n = 3, 6.4\%$ ).

**Table 3**

*Character strengths ranked by the frequency each strength featured as a signature strength ( $n = 47$ )*

Character strength	Category	Rank	n	%	
Honesty	Restraint	1	34	72.3	
Beauty and Excellence <sup>a</sup>	Theological	2	30	63.8	Top five signature strengths
Love of Learning	Intellectual	3	27	57.4	
Fairness	Interpersonal	4	25	53.2	
Kindness	Interpersonal	5	24	51.1	
Judgement	Intellectual	6	22	46.8	
Bravery	Emotional	7	17	36.2	
Creativity	Intellectual	9	13	27.7	
Curiosity	Intellectual	9	13	27.7	
Humour	Emotional	9	13	27.7	
Perspective	Restraint	11	12	25.5	
Humility	Interpersonal	12	11	23.4	
Leadership	Interpersonal	13	9	19.1	
Prudence	Restraint	14	8	17.0	
Love	Emotional	15.5	6	12.8	
Forgiveness	Interpersonal	15.5	6	12.8	
Spirituality	Theological	17	5	10.6	
Hope	Emotional	18	4	8.5	
Perseverance	Restraint	19.5	3	6.4	
Self-regulation	Restraint	19.5	3	6.4	
Zest	Emotional	22	2	4.3	Bottom five signature strengths
Social Intelligence	Emotional	22	2	4.3	
Teamwork	Interpersonal	22	2	4.3	
Gratitude	Theological	24	1	2.1	

*Note.* Where there was a tie between the fifth-ranked strength for an individual, all strengths in the tie were counted as a signature strength for that individual.

<sup>a</sup> Abbreviated from *Appreciation of Beauty and Excellence*

### Character strengths and satisfaction with life

The mean satisfaction with life score was neutral; that is, overall, the sample neither agreed or disagreed with the statements in the SWLS, although there was a considerable variation in the responses given ( $M = 3.95$ ,  $SD = 1.65$ ). Kendall's tau correlations for both the 24 character strengths and five strength categories of the VIA-IS with the SWLS were computed, accounting for multiple comparisons being made (see Table 4). At the strength category level, *Interpersonal* strengths were significantly related to satisfaction with life. A significant positive association with life satisfaction was found for *Gratitude* (theological), *Hope* (emotional) and *Honesty* (restraint).



**Table 4**

*Kendall's tau correlations and p-values between character strengths and the SWLS (n=47)*

Character strength	Correlation with SWLS	p-value
<b>Emotional Total</b>	.127	.218
Hope	<b>.278*</b>	<b>.009</b>
Zest	.211	.046
Social Intelligence	.039	.711
Love	.076	.471
Humour	-.176	.096
Bravery	-.150	.157
<b>Intellectual Total</b>	.041	.692
Love of Learning	.114	.283
Judgement	.034	.753
Creativity	-.051	.636
Curiosity	-.032	.760
<b>Interpersonal Total</b>	<b>.284*</b>	<b>.006</b>
Forgiveness	.240	.024
Teamwork	.223	.036
Leadership	.150	.153
Humility	.182	.086
Fairness	.117	.277
Kindness	.173	.106
<b>Restraint Total</b>	.234	.024
Honesty	<b>.274*</b>	<b>.012</b>
Self-Regulation	.209	.046
Perseverance	.187	.076
Perspective	.174	.106
Prudence	.115	.279
<b>Theological Total</b>	.135	.194
Gratitude	<b>.298*</b>	<b>.005</b>
Spirituality	-.003	.978
Appreciation of Beauty and Excellence	-.023	.831

*Note.* SWLS = Satisfaction with Life Scale. Statistical significance is indicated with \* and refers to the Benjamini and Hochberg (1995) corrected significance level  $q$ -value of  $< .02$ .

### Discussion

The purpose of this study was to investigate the self-rated endorsement of character strengths and their association with satisfaction with life in autistic adults. Whereas the first hypothesis was partially supported, full support was found for the second hypothesis.

**Hypothesis 1:** The results of this research do not support the hypothesis that the five top-ranked strengths, or *signature strengths*, of autistic adults consist largely of intellectual strengths. The *signature strength* profile in this study spanned four strength categories (restraint, theological, intellectual and interpersonal) and was congruent with characteristic autistic traits, including intense interests and strong attention to detail. However, at an aggregate category level, intellectual strengths scored higher than interpersonal and emotional strengths, as expected.

**Hypothesis 2:** The results provide support for an association between life satisfaction and the character strength of *Hope* (emotional). In addition, character strengths of *Gratitude* (theological) and *Honesty* (restraint) were related to satisfaction with life in this study.

### **Character strengths in autistic adults**

The present results partially replicated previous findings about character strengths in autistic adults in German-speaking countries (Kirchner et al., 2016; Samson & Antonelli, 2013). As expected, *intellectual* strengths were reported more frequently than *emotional* and *interpersonal* strengths, when viewed at an aggregate level. However, the endorsement of specific character strengths within each category varied considerably across participants. Specifically, the *interpersonal* skills of *Fairness* and *Kindness* were amongst the five top-ranked strengths or *signature strengths*. Furthermore, contrary to previous findings (Kirchner et al., 2016; Samson & Antonelli, 2013), the *signature strengths* observed in the present study did not consist mainly of *intellectual* strengths. Only one *signature strength* (*Love of Learning*) was classified as *intellectual* compared to three (*Judgement*, *Love of Learning*, *Curiosity/Creativity*) in previous research (Kirchner et al., 2016; Samson & Antonelli, 2013). Nevertheless, the *signature strength* profile in this study was consistent with characteristic autistic traits, as discussed below, and the profile of disabled people more broadly (Umucu et al., 2022).

The identification of *Honesty*, *Love of Learning* and *Fairness* as *signature strengths* is consistent with the previous literature on character strengths in autistic adults (Kirchner et al., 2016; Samson &

Antonelli, 2013). These findings support existing research in autism studies. In particular, the high scoring for *Honesty*, telling the truth and keeping one's promises, and *Fairness*, treating everyone fairly according to concepts of fairness and justice, in autistic adults can be understood through the lens of insensitivity to social reputation (Izuma et al., 2011) and strong sense of social justice and fairness (Cope & Remington, 2022; Russell et al., 2019). Furthermore, *Love of Learning* reflects the intrinsic motivation in autistic individuals to engage with specific interests (Grove et al., 2016). It helps build specialist knowledge in a chosen field of interest (McDonnell & Milton, 2014), which was reported to be one of the areas of autism advantage at work in a systematic review (Bury et al., 2020).

An interesting finding is that *Appreciation of Beauty and Excellence* (theological) and *Kindness* (interpersonal) ranked as *signature strengths* in the present study, in contrast to the findings in previous studies with the target population in German-speaking countries (Kirchner et al., 2016; Samson & Antonelli, 2013). A possible explanation for this difference is that language or cultural differences may have influenced the disparity in the endorsement of character strengths (Biswas-Diener, 2006). Reassuringly, both *Appreciation of Beauty and Excellence* and *Kindness* ranked as signature strengths in a recent large-scale international study in people with various disabilities (Umucu et al., 2022). Furthermore, the results reflect the research base on autistic traits. Noticing beauty and excellence requires attention to detail and pattern recognition, both of which are recognised as autistic strengths (e.g., Ashwin & Brosnan, 2019; Bury et al., 2020; Cope & Remington, 2022; Russell et al., 2019). Furthermore, several recent studies provide support for *Kindness*. The findings include autistic children self-reporting as kind and caring (Clark & Adams, 2020), *Kindness* being one of the four most prevalent qualities reported in autistic children by their parents (Cost et al., 2021), and autistic individuals being more generous than non-autistic people (Tei et al., 2019).

### **Character strengths and satisfaction with life**

A significant association with satisfaction with life was found for an emotional strength of *Hope*, hence supporting the second hypothesis. This finding concurs with both Samson and Antonelli (2013) and Kirchner et al.'s (2016) studies in autistic adults and studies in the general population (Park et al., 2004; Peterson et al., 2007; Proyer et al., 2013). The results support the existing evidence base and strongly imply that life satisfaction is associated with the cultivation of hope.

In addition, the present research found the strengths of *Gratitude* (theological) and *Honesty* (restraint) to be linked with life satisfaction in autistic adults. This outcome is in contrast to Kirchner et al. (2016) who instead found *Zest*, *Kindness*, *Humour*, *Social Intelligence* and *Teamwork* (all emotional and interpersonal skills) to be significantly correlated with life satisfaction in autistic adults. This might be due to several reasons, including differences in the cross-sectional profile of the present sample and cultural and language differences, which may have affected the interpretation of questions in the questionnaires. In particular, the present sample exhibited higher mean life satisfaction score than Kirchner et al.'s (2016) autistic sample and was above the clinical threshold for depression on average. The findings suggest that life satisfaction in autistic adults is not restricted to emotional and interpersonal strengths, contrary to Kirchner et al. (2016), but includes a more holistic profile of multiple life domains. Nevertheless, at an aggregate level, *interpersonal* strength category was significantly related to satisfaction with life. Further research is required to validate the findings.

### **Implications**

The study has practical implications for the wellbeing of autistic individuals, by highlighting a distinct *signature strengths* profile that is consistent with autistic strengths and traits reported in autism research. In this context, autism can be viewed through the lens of individual character strengths overuse. For example, *fixated interests* (American Psychiatric Association, 2013) could be understood as an overuse of character strengths of *Love of Learning* and *Appreciation of Beauty and Excellence*. This perspective offers a more positive conceptualisation of autism, congruent with the paradigm shift of the

*neurodiversity movement* (Sinclair, 1993; Singer, 1999). Mental health professionals could use the VIA character strengths framework to cultivate a positive autism identity, which in itself enhances collective self-esteem (R. Cooper et al., 2021) and is a protective factor against mental health problems (K. Cooper et al., 2017). In education, the knowledge of *signature strengths* could be used in increasing motivation and educational planning (Cosden et al., 2006).

In the present study, character strengths of *Gratitude*, *Hope* and *Honesty* were related to satisfaction with life. Out of the three strengths, only *Hope* has been consistently reported to be associated with life satisfaction in previous studies with the autistic population. Furthermore, the use of *Hope* was found to be a protective factor against depression (Hall-Simmonds & McGrath, 2019). Whilst hope instillation has been recognised as an important aspect of the recovery model (Jacobson & Greenley, 2001) and group therapy (Yalom & Leszcz, 2005), positive psychology hope-based interventions, such as *Hope Therapy* (Cheavens et al., 2006), may be explicitly used to promote positive health outcomes in autistic adults. More research is needed to investigate the efficacy of specific interventions targeting hope development in the autistic adult population, and to verify which character strengths, other than *Hope*, are linked to life satisfaction in autistic adults.

### **Limitations and future directions**

Whilst the results of the present research are promising, there are important limitations that need to be acknowledged. First, the study used self-reported questionnaires for general population. This could impact the interpretation of questions asked and the answers provided due to autistic cognitive characteristics, such as literal understanding of speech (Happé, 1995). For consistency and comparability with previous studies that used the VIA character strengths classification, the SWLS was used to measure global wellbeing. However, this scale was not validated with autistic individuals and may not capture the wellbeing of this population group adequately. Future research in this area could explore the use of an autism-specific wellbeing measure, such as the Quality of Life Measure for Autistic People

(McConachie et al., 2018), to assess character strengths that are most linked to positive mental health outcomes.

The sample comprised highly educated autistic adults, which may affect the generalisation of the findings. Given the high literacy levels required to complete the surveys, the generalisation of the findings is likely to be limited to autistic individuals without cognitive and language difficulties or intellectual disability. Moreover, although the recruitment method targeted online autistic communities and the majority of participant self-reported having a formal diagnosis, the lack of independent verification of autistic traits may be viewed as limiting this study's validity and replicability. Future research would benefit from larger and more diverse samples, and collecting additional information to address these factors.

### **Conclusion**

The present study contributes new knowledge to character strength endorsement and application in the wellbeing of autistic adults. Specifically, this study highlights a distinct yet diverse *signature strength* profile consistent with autistic characteristics and reports three character strengths that relate to life satisfaction. To our knowledge, this is the first study investigating the potential of the VIA character strengths methodology to promote positive mental health in autistic adults in the United Kingdom. The current study encourages further research into the application of positive psychology in supporting and enhancing good health outcomes in autistic individuals.

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### **CRedit authorship contribution statement**

Alicja Sabina Nocon: Conceptualisation, Methodology, Investigation, Data Curation, Formal analysis, Writing - original draft, Visualisation.

Amanda Roestorf: Conceptualisation, Methodology, Writing - review & editing

Luz María Gutiérrez Menéndez: Writing - review & editing, Resources, Supervision.

**Declaration of Competing Interest**

None.

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