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# Mental wellbeing, but not prison climate, mediates the association between autistic traits and treatment readiness among men with sexual convictions

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## ABSTRACT

Research suggests that autistic individuals have qualitatively unique experiences of prison social environments, and that these experiences may have implications for autistic prisoners' mental wellbeing and engagement with offending behaviour interventions. However, this has yet to be quantitatively tested. Using a sample of 177 adult prisoners from two UK prisons that exclusively house individuals with sexual convictions, this study tested a hypothesised double-mediation model, to investigate associations between autistic traits and prisoners' readiness to engage with treatment, and whether this was mediated by experiences of the prison social climate and mental wellbeing. Results indicated that prisoners with higher levels of autistic traits had poorer experiences of prison social climates, which, in turn, predicted higher levels of anxiety and depression, which subsequently predicted reduced level readiness to engage with offending behaviour interventions. Implications for research and practice are discussed, emphasising the need for increased autism-related awareness and support provisions in prisons.

## PRACTICE IMPACT STATEMENT

The present study is a novel quantitative study, which is the first to statistically demonstrate that neurodivergence can significantly influence prisoners' perceptions of prison social climates, mental wellbeing, and ultimately readiness to engage with rehabilitate interventions. As such, these findings emphasise the importance of embedding understanding neurodiversity in prison staff training, as well as considering and accommodating neurodiversity as a key dimension in the development of a prison's rehabilitative culture.

## ARTICLE HISTORY



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## KEYWORDS

Autism; neurodivergence; sexual offending; mental wellbeing; rehabilitation; treatment readiness

## Introduction

Research has indicated that autistic individuals are generally less likely than non-autistic people to engage in criminal acts (Mouridsen et al., 2008), more likely to become victims of crime (Griffiths et al., 2019), and that autism can, in fact, be a protective factor against offending behaviour (see Lindsay et al., 2014). Nevertheless, autistic people are over-represented in the justice system (Loureiro et al., 2018), and within the minority of autistic individuals who do engage in crime, sexual offences

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have been highlighted as one of the more common types of crime in this group (see Allely & Creaby-Attwood, 2016). Therefore, it is important to use research to enhance understanding of the nuances associated with working with autistic individuals in prison-based sexual offending interventions, and to ensure that autistic people in custody receive appropriate support within and around offending behaviour programmes, to reduce the likelihood of recidivism (Vinter et al., 2023).

Current evidence suggests that aspects of the prison experience are qualitatively different for autistic prisoners – with specific challenges associated with experiences of prison social and sensory environments, rules and regimes often cited in the literature (Newman et al., 2015; User Voice, 2023; Vinter et al., 2020; Woodhouse et al., 2024). Corresponding with this, in the UK, there has been increased recognition of the overrepresentation of neurodivergent individuals in prison, a call for greater understanding of neurodivergent individuals' unique experiences of the criminal justice system, and an expressed need to adapt prison environment and practices specifically to the needs of neurodivergent prisoners (Criminal Justice Joint Inspection [CJJI], 2021; Ministry of Justice [MOJ], 2022; Woodhouse et al., 2024). Recent qualitative research suggests that these experiences of the broader prison context may be particularly impactful on autistic prisoners' rehabilitation within offending behaviour programmes (OBPs) to address sexual offending (Vinter et al., 2023). For example, Vinter et al. (2023) found that experiences of difficult social interactions with prison staff and other prisoners (e.g. confrontations, alienation and bullying), adverse experiences of the prison sensory environment (particularly the auditory environment), inconsistent prison regimes, mixed levels of autism awareness and the availability of other support provisions all appear to play an important role in mediating mental wellbeing for autistic prisoners (particularly anxiety and mood); which could then impact individuals' engagement with OBPs. More specifically, Vinter et al.'s (2023) findings suggested that those who experienced more anxiety, stemming from the broader prison experience, seemed to be less willing to engage in OBPs. For example, participants in that study highlighted how social confrontations that autistic prisoners experienced with others in the prison (e.g. prison officers and other prisoners), often stemming from both misunderstanding others and being misunderstood by other people (see double-empathy problem, Mitchell et al., 2021), contributed to ruminating on enduring feelings of anxiety and low mood, which had a negative "ripple effect" (p. 7) on an autistic individual's participation and engagement in OBPs. Therefore, beyond on-programme-specific responsivity issues (Higgs & Carter, 2015), it could be inferred that the broader prison experience has specific counter-therapeutic effects for autistic prisoners, potentially reducing benefits they may have been otherwise able to reap from OBPs. However, this idea is yet to be empirically tested. The current paper makes an original and significant contribution to the literature, building on previous research highlighting the relationship between prison climate and mental wellbeing (Goomany & Dickinson, 2015) and prison climate and readiness to engage in OBPs (Blagden et al., 2016). Specifically, this study is the first to test the hypothesised association between autistic traits, mental wellbeing, experiences of the prison social environment and the extent to which individuals with sexual convictions are ready to engage in psychological interventions.

### *Working with autistic individuals in therapeutic prison contexts*

Existing prison-based programmes for individuals with sexual convictions in the UK tend to adopt a risk-need-responsivity (RNR) model, where actuarial assessments of static risk determine the programme that an individual will be placed on (typically Horizon for those assessed as medium risk, and Kaizen for those assessed as high or very high risk). Within programmes there are specific criminogenic needs that are targeted, with sex offending specific programmes placing a heavy emphasis on relational skills, emotional regulation and effective problem solving (Harrison et al., 2020; Ward & Durrant, 2013). The responsivity aspect emerges when considering issues such as cognitive ability (usually determined using an IQ assessment) or specific needs related to learning style, with programmes being adapted to improve both access to treatment and engagement with the support on offer (Looman et al., 2005). However, even within an ostensibly responsive framework there is

still a focus on manualised treatment, where service users follow a set programme (albeit focused on their specific triggers). Although there is an absence of quantitative data relating to treatment outcomes for autistic individuals with sexual convictions, it is known from past research that it is important to recognise the individuality of neurodivergent individuals in treatment (Vinter et al., 2023; Woodhouse et al., 2024). This is particularly important when working with autistic individuals who might struggle with the kinds of specific tasks that are commonplace in treatment programmes for those with sexual convictions. Vinter et al. (2023) identified several features of prison-based sexual offending programmes that autistic people can experience as challenging, impacting their engagement with said programmes (e.g. social integration with a programme group, content related to exploring emotions, exercises that involve perspective-taking and hypothetical thinking, unpredictability and inconsistency, and processing information). Though, it must be noted that on-programme challenges experienced by autistic individuals are not ubiquitous, and are instead often contingent on the degree to which specific responsiveness adaptations have been made for those individuals (Higgs & Carter, 2015; Vinter et al., 2023).

However, it is not only programme-specific issues that impact long-term treatment effectiveness. There is a growing body of literature that explores how prisoners' experiences and perceptions of a prison's social climate can be impactful upon rehabilitation experiences and effectiveness of interventions (Beazley & Gudjonsson, 2011; Blagden et al., 2016; Mann et al., 2019; van der Helm et al., 2014). Prison social climates are complex, multifaceted and are constructed of a number of characteristics that encapsulate how a prison is subjectively experienced by both the residents who live there and staff who work within them (Lewis, 2017; Liebling et al., 2012; Tonkin, 2016). Commonly cited dimensions of a prison social climate include the perceived safety from aggression and violence, the quality of staff-prisoner relationships, the support available to accommodate the psychological and physical needs of prisoners, and the extent to which an environment enables therapeutic change (Mann et al., 2019; Schalast et al., 2008; Tonkin, 2016). There has been an increased recognition of the value of improving social climates in prisons as important additional therapeutic tools in prisoner rehabilitation (Day et al., 2012; Reading & Ross, 2020), with moves in the UK towards an explicit focus on the development of so-called *rehabilitative cultures* in prisons settings (HM Prison and Probation Service [HMPPS], 2018).

Again, these issues are particularly important for neurodivergent populations, such as those with higher levels of autistic traits. For instance, Vinter et al.'s (2023) qualitative investigation found that autistic individuals serving a sentence for a sexual offence reported how experiences within the prison social climate (such as challenging social interactions with prison staff and other prisoners) were an impactful dimension of their broader rehabilitation experiences, and played an important role in affecting the mental wellbeing of autistic prisoners (particularly in relation to the experience of anxiety and depression). It was also suggested that such reductions in mental wellbeing could have a ripple effect on autistic individuals' engagement with formal OBPs, impacting how and whether they felt motivated and/or able to engage with those programmes.

Therefore, it may be suggested that those autistic individuals serving sentences for sexual convictions, who experience more anxiety due to the broader prison experience, may be less willing to participate in OBPs, and/or may disengage from treatment while OBPs are ongoing. These ideas map onto Ward et al.'s (2004) Multifactor Offender Readiness Model (MORM), which conceptualises treatment readiness as the result of an interaction between the characteristics present within an individual (i.e. internal conditions) and the characteristics of the therapeutic context within which they are situated (i.e. external conditions). According to Ward et al. (2004), internal conditions include the conscious decision to make a change and a desire to move towards an identified goal. Consistent with Self Determination Theory (SDT; Deci & Ryan, 1985), these decisions contain an affective component (i.e. an emotional desire to change) as well as a cognitive component (i.e. some degree of behavioural planning). Such processes primarily pertain to a shift in an individual's desired identity or self-concept, which can be facilitated by a positive social climate both within prisons and in the community upon release (Göbbels et al., 2012; Lewis, 2017; Ware & Galouzis, 2019; Weaver, 2013).

In relation to autistic individuals with a sexual conviction(s), the authors suggest that autistic traits impact people's experiences of the prison social climate, which in turn influences mental health and wellbeing (notably in the form of anxiety and/or depression); and mental health and wellbeing function as influential internal conditions that impact people's readiness for psychological interventions. We suggest that an individual's autistic traits alone are not what determine engagement in treatment, but for autistic individuals, they may be more likely to have different social climate experiences, which impact mood, and ripple into treatment readiness. As reported earlier, Vinter et al. (2023) suggested a reciprocal interaction between these internal conditions and the external prison context when thinking about the engagement of autistic individuals with formal OBPs. In particular, the prison social climate may be a particularly influential external condition for autistic individuals who experience particular challenges in the social arena (American Psychiatric Association [APA], 2022). However, prior to the current study, these ideas have never been tested quantitatively.

### *The current study*

Given the lack of quantitative investigations on this topic, the current study aimed to test (i) whether autistic traits can predict prisoners' experiences and perceptions of prison social climates and (ii) to assess the mediating effects of mental wellbeing and perceptions of the prison climate on the association between autistic traits and readiness to engage with interventions.

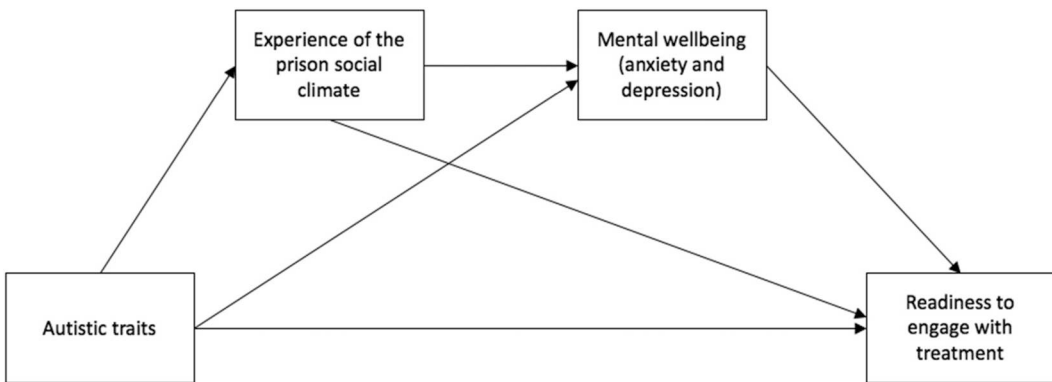
To achieve these aims, the research reported here took place in two UK prisons that exclusively house men with sexual convictions. In contrast to those residing in broader mainstream prisons, prisoners housed in these therapeutically oriented specialist prisons typically report more positive experiences of the prison social climate, describing them as "a different world" (Blagden et al., 2019, p. 155). This is in comparison to mainstream prison settings, where prisoners with sexual convictions no longer feel that they must live in fear or mask their identities (and their offences) for fear of reprisal.

Although there have been promising steps taken in research and practice regarding the shaping of prison social climates for people with sexual convictions, and increasing focus on addressing the needs of neurodivergent people in the criminal justice system, there is currently no research that has focused specifically on the impact of a prison social climate on autistic individuals. This is in spite of an emerging body of work suggesting that autistic individuals may have a qualitatively different experience of the prison social world to their neurotypical peers, including increased likelihood of encountering confrontations with others, becoming socially isolated and/or experiencing bullying and manipulation by others (Newman et al., 2015; User Voice, 2023; Vinter et al., 2020, 2023). In this context, neurodivergent prisoners who are diagnosed as autistic or exhibit high autistic traits may have different experiences of a prison social climate, even when housed in specialist prisons based on their offending history (Vinter et al., 2020). Specifically, then, this study sought to quantitatively investigate whether autistic traits impact prisoners' readiness to change via their experience of the prison social climate. Acknowledging the potential additional role of mental wellbeing (see Vinter et al., 2023), this study explored whether such a mediation effect additionally ran through symptoms of anxiety and depression, as might be expected within Ward et al.'s (2004) MORM framework to understanding treatment readiness. As such, it was hypothesised that participants with higher levels of autistic traits would have poorer experiences of the prison social climate, and that, in turn, would predict poorer mental wellbeing and a reduced willingness to engage with rehabilitation. The hypothesised double mediation model is presented in [Figure 1](#).

## **Methods**

### *Setting and participants*

Governors of two UK prison sites that exclusively housed men with sexual offence convictions and provided on-site sexual offending behaviour intervention programmes were approached with



**Figure 1.** Hypothesised double mediation model testing for direct and indirect effects of autistic traits on readiness to engage in treatment, via perceptions of the prison social climate and levels of mental wellbeing.

information about the research and were invited to take part in this cross-sectional survey. This provided a sampling frame of approximately 1600 prisoners across two UK prison sites that exclusively housed adults with sexual offence convictions, and resulted in the participation of 177 adult prisoners (174 male, 3 transgender female), aged 22–90 years ( $M = 46.53$  years,  $SD = 15.58$ ), – Prison A ( $n = 105$ ) and Prison B ( $n = 72$ ). A pre-existing autism diagnosis was self-reported by 12% of the sample ( $n = 21$ ). However, this could not be corroborated with official file information, due to confidentiality restrictions and inconsistencies in the location of this information.

## Measures

### Demographics

Participants were asked to report their age and to tick a box if, to their knowledge, they had ever been diagnosed with one, or more, of the following conditions: Autism Spectrum Disorder (ASD), Asperger’s Syndrome, High Functioning Autism, Autistic Disorder, Pervasive Developmental Disorder (PDD).

### Autism Quotient 50 (AQ50)

The AQ50 (Baron-Cohen et al., 2001) is a widely used 50-item self-report measure of autistic traits, designed for research use. The AQ has been used in a variety of previous research studies in both its 50-item and 10-item forms, including in prison-based research (e.g. Fazio et al., 2012; Loureiro et al., 2018; Robinson et al., 2012). The AQ50 measures autistic traits across five subscale areas: “Social Skill”, “Attention Switching”, “Attention to Detail”, “Communication” and “Imagination”. Participants were presented with 50 statements<sup>1</sup> (e.g. “New situations make me anxious”), and asked to rate whether they Definitely Agree, Slightly Agree, Slightly Disagree or Definitely Disagree. Responses to the AQ50 are scored dichotomously either 1 or 0 for each item (“Definitely Agree” and “Slightly Agree” are collapsed into “Agree” and similarly for “Disagree”), with higher scores indicating a greater level of autistic traits. The measure demonstrated good internal consistency in the current sample ( $\alpha = 0.89$ ). Although the AQ50 is not a diagnostic tool, it has been suggested that a score of  $\geq 32$  out of 50 may be a useful threshold for distinguishing individuals who have clinically significant autistic traits (Baron-Cohen et al., 2001).

### Essen Climate Evaluation Schema (EssenCES)

The EssenCES (Schalast et al., 2008, rev. 2010, 2016) is a 17-item self-report measure of social climates in forensic settings, which has been validated for use in prison settings (Day et al., 2012). The scale measures prison social climate across three subscale dimensions; “Inmate Cohesion” refers to how



much a participant believes prisoners care for each other (e.g. *"Inmates care about their fellow inmates' problems"*), "Experienced Safety" refers to levels of perceived tension and threat of aggression or violence (e.g. *"Really threatening situations can occur here"*; reverse-scored), and "Hold and Support" refers to the quality of prisoner-staff relationships and the degree to which prison staff take a personal interest in the progress of prisoners (e.g. *"Staff take a lot of time to deal with inmates"*). Each factor contains five items, with two "filler" items that are not scored. For each item, participants were asked to respond using a scale ranging from 0 (*"Not at all"*) to 4 (*"Very much"*). Higher total scores on this scale indicate a more positive experience of the prison social climate. In the current sample, this measure demonstrated excellent internal consistency as a composite scale ( $\alpha = 0.91$ ) and good-to-excellent internal consistency across the individual subscales (Inmate Cohesion  $\alpha = 0.91$ ; Experienced Safety  $\alpha = 0.86$ ; Hold and Support  $\alpha = 0.86$ ).

### **Hospital Anxiety and Depression Scale (HADS)**

The HADS is a 14-item self-report measure of anxiety and depression levels (Zigmond & Snaith, 1983). It is made up of two seven-item subscales measuring anxiety (HADS-A) and depression (HADS-D). Participants were presented with the 14 statements (e.g. *"I still enjoy the things I used to enjoy"*), and asked to indicate which reply is closest to how they have felt over the past week using a four-point scale anchored from *"Definitely as much"* to *"Hardly at all"*. Items are scored 0-3, with several items reverse coded. Higher scores on the scale indicate the presence of higher levels of anxiety and or depression. The HADS demonstrated excellent internal consistency as a composite measure of poor mental wellbeing in the current sample ( $\alpha = 0.93$ ).

### **Corrections Victoria Treatment Readiness Scale (CVTRS)**

The CVTRS (Casey et al., 2007) is a 20-item self-report measure designed to assess readiness for interventions in offending populations, and is constructed of four subscales ("Attitudes and Motivation", "Emotional Reactions", "Offending Beliefs" and "Efficacy") that can be combined into a single composite score indicating readiness for treatment. Each statement (e.g. *"Stopping offending is really important to me"*) was responded to by participants indicating the extent to which they agreed using a 5-point Likert-type scale from 1 (*"Strongly Disagree"*) to 5 (*"Strongly Agree"*). Higher scores indicated a higher degree of readiness to participate in interventions, with a total cut-off score of  $>72$  regarded as indicative of "ready to treat" (Casey et al., 2007, p. 1437). This measure demonstrated good internal consistency in the current sample ( $\alpha = 0.83$ ).

### **Sampling and data collection**

Participant envelope packs (containing an information and consent form, participant instructions, AQ50, EssenCES, HADS, CVTRS, debrief sheet, and pre-addressed envelope) were distributed under cell doors across all wings of both establishments, with the assistance of wing security officers. Across the two sites, approximately 1600 packs were distributed (Prison A = 850; Prison B = 750). Materials emphasised the voluntary nature of the research and provided potential participants with instructions of how to participate, what information to return and a means of returning their responses (pre-addressed envelopes).<sup>2</sup>

Individuals willing to participate were instructed to complete and return consent forms and questionnaires (AQ50, EssenCES, HADS, CVTRS), and to retain debrief sheets should they need to contact the research team or seek support. Pre-addressed envelopes allowed for responses to be returned through the internal mail system to a dedicated in-tray in the respective Psychology departments at each prison. Wing staff and listeners who worked or lived on each wing offered to support participants who struggled to understand or engage with any written materials. Participants could also contact the researcher to request support.

Completed research packs were opened, and containing data were subsequently manually inputted, on prison grounds. Completed consent forms were separated from questionnaire response

data, assigned a unique participant identifier (in case participants sought to withdraw their data), and were stored separately in secure filing cabinets accessible only to the research team. The overall participant response rate was 11.06%, which is lower than other social climate research that has taken place in these prisons (e.g. 28% reported in Blagden et al., 2016). However, this previous research selectively distributed only 400 questionnaires, which may have led to an inflated response rate.

## Analytic procedure

### Data cleaning

Of the 177 participant responses, 112 participants had fully completed all scales. To maximise statistical power, methods of imputation to resolve missing data were considered. Little's (1988) missing-completely-at-random (MCAR) test was first conducted on each measure to analyse whether missing values were MCAR. This was done to ensure that there were no systematic differences between missing values and observed values, which may cause biases in subsequent imputation and analyses (Sterne et al., 2009). As demonstrated in Table 1, Little's MCAR tests were all statistically non-significant, which suggested that missing data were random, rather than systematic (Almquist et al., 2014). Therefore, using the SPSS missing value analysis function, an expectation-maximisation (EM) approach was employed to resolve missing data, as recommended by Tabachnick and Fidell (2014). EM is a probabilistic single imputation method, which uses an iterative algorithmic procedure of using other observed variables to impute a missing value (i.e. expectation), and then checking whether that value is the most likely response when comparing it to the broader patterns of the dataset (i.e. maximisation) (Ghomrawi et al., 2011; Wang et al., 2021). EM repeats this process until it reaches convergence to impute the most likely value for the missing data point while minimising the bias of the parameter estimates.

All subsequent analyses were conducted twice, with EM imputed data ( $n = 177$ ) and without ( $n = 112$ ), to ensure that the reported findings remained representative of the original full dataset. Results were consistent across both the imputed and raw datasets. Therefore, only the results associated with the imputed data analyses are presented here, to maximise statistical power of the results reported below.

### Data analysis

Using IBM SPSS software, descriptive statistics were calculated for all scales and demographic data. Independent samples *t*-tests were used to identify any significant differences in mean scores on scales between each prison establishment, and to investigate whether any significant differences were present in mean scores on scales between those above and those below the clinically significant threshold for the AQ50. A bivariate correlational analysis was used to investigate relationships between scores on all scales. The primary analysis used in this study was a double mediation analysis, using the PROCESS macro (Hayes, 2017) in IBM SPSS. PROCESS is an additional modelling tool that can be used in SPSS, which facilitates variable path analysis-based mediation and moderation analyses (Hayes, 2018). In this research, PROCESS was used to identify whether autistic traits (measured by the AQ50) have an indirect effect on readiness to engage with treatment (measured by the

**Table 1.** Little's MCAR test outputs for AQ50, EssenCES, HADS and CVTRS measures.

Measure	$\chi^2$	<i>df</i>	<i>p</i>
AQ50	679.24	649	.199
EssenCES	166.33	155	.253
HADS	25.58	42	.978
CVTRS	273.31	239	.063

Note. AQ50 = Autism Quotient 50; EssenCES = Essen Climate Evaluation Schema; HADS = Hospital Anxiety and Depression Scale; CVTRS = Corrections Victoria Treatment Readiness Scale.



CVTRS), when mediated by experiences of the prison social climate (measured by the EssenCES), and mental wellbeing (measured by the HADS).

## Ethics

Ethical approval for this study was granted by Nottingham Trent University's College Research Ethics Committee and Her Majesty's Prison and Probation Service's (HMPPS) National Research Committee, prior to commencement.

## Results

### Descriptive statistics

Table 2 shows descriptive statistics for participant scores on each measure used. Of note, it was found that autistic traits, measured by the AQ50, were relatively moderate across the sample ( $M = 23.88$ ,  $SD = 9.89$ ), and below the 32 (or above) out of 50 thresholds often used to distinguish individuals who have clinically significant autistic traits (Baron-Cohen et al., 2001). Moreover, within the EssenCES scale ( $M = 28.74$ ,  $SD = 11.19$ ), it was clear that Experienced Safety ( $M = 11.24$ ,  $SD = 4.77$ ) was the highest rated subdimension of prison social climates, which may be indicative of the types of prisons used as research sites in this research (i.e. prisons exclusively housing individuals with sexual convictions). Overall scores on the HADS ( $M = 17.64$ ,  $SD = 9.88$ ) were relatively high in this sample. In particular, scores on the Anxiety subscale ( $M = 9.77$ ,  $SD = 5.70$ ) typically exceeded the  $\geq 8$  cut-off score for caseness (Bjelland et al., 2002), with Depression scores approaching close to this threshold ( $M = 7.87$ ,  $SD = 4.93$ ). Finally, mean CVTRS scores ( $M = 78.34$ ) indicated that prisoners in the sample typically scored above the  $>72$  cut-off score, suggesting readiness to treat (Casey et al., 2007), though the standard deviation ( $SD = 11.70$ ) suggested a fair amount of variability in this.

Table 3 shows descriptive statistics divided by prison establishment. A series of independent sample *t*-tests were also conducted to identify any significant differences between mean scores from each prison. It was found that mean scores on the EssenCES measure were significantly higher at Prison B than at Prison A, with a significant difference in relation to inmate cohesion specifically. However, despite some surface-level differences between Prison A and Prison B in relation to

**Table 2.** Descriptive statistics for total scores on AQ50, EssenCES, HADS and CVTRS measures.

Measure	<i>n</i>	<i>M</i>	<i>SD</i>	Minimum	Maximum
AQ50	177	23.88	9.89	5	50
Social Skill	177	5.08	3.00	0	10
Attention Switching	177	5.50	2.59	0	10
Attention to Detail	177	5.04	2.74	0	21
Communication	177	4.11	2.91	0	10
Imagination	177	4.15	2.19	0	10
EssenCES	177	28.74	11.19	3	57
Cohesion	177	8.96	4.54	0	20
Safety	177	11.24	4.77	0	20
Hold	177	8.53	4.67	0	20
HADS	177	17.64	9.88	0	39
Anxiety	177	9.77	5.70	0	21
Depression	177	7.87	4.93	0	20
CVTRS	177	78.34	11.70	30	97
Attitudes and Motivation	177	24.84	4.49	6	30
Emotional Reactions	177	23.74	4.82	7	30
Offending Belief	177	15.49	4.36	3	20
Efficacy	177	14.28	2.77	6	19

Note. AQ50 = Autism Quotient 50; EssenCES = Essen Climate Evaluation Schema; HADS = Hospital Anxiety and Depression Scale; CVTRS = Corrections Victoria Treatment Readiness Scale.

**Table 3.** Descriptive statistics and *t*-test values for total scores on AQ50, EssenCES, HADS and CVTRS measures across specific establishments.

	Prison A	Prison B	<i>t</i>	<i>p</i>	<i>d</i>
AQ50	23.63 (9.72)	24.25 (10.20)	0.40	.686	0.06
Social Skill	5.13 (3.02)	5.02 (2.30)	-0.24	.810	0.04
Attention Switching	5.40 (2.67)	5.65 (2.49)	0.64	.526	0.10
Attention to Detail	4.84 (2.86)	5.32 (2.56)	1.14	.255	0.18
Communication	4.03 (2.87)	4.21 (2.99)	0.41	.681	0.06
Imagination	4.23 (2.15)	4.04 (2.25)	-0.57	.572	0.09
EssenCES	27.17 (11.40)	31.03 (10.53)	2.28	.024*	0.35
Cohesion	8.16 (4.61)	10.13 (4.20)	2.90	.004**	0.45
Safety	10.69 (4.78)	12.05 (4.68)	1.87	.063	0.29
Hold	8.32 (4.58)	8.85 (4.80)	0.75	.456	0.11
HADS	17.29 (9.40)	18.15 (10.58)	0.57	.570	0.09
Anxiety	9.79 (5.54)	9.73 (5.95)	-0.07	.940	0.01
Depression	7.50 (4.61)	8.42 (5.35)	1.23	.220	0.19
CVTRS	79.37 (11.67)	76.84 (11.66)	-1.42	.159	0.22
Attitudes and Motivation	25.29 (4.48)	24.17 (4.45)	-1.64	.104	0.25
Emotional Reactions	23.76 (4.53)	23.69 (5.23)	-0.10	.922	0.02
Offending Belief	16.12 (4.12)	14.58 (4.57)	-2.32	.021*	0.36
Efficacy	14.20 (2.84)	14.39 (2.69)	0.46	.645	0.07

Note. AQ50, Autism Quotient 50; EssenCES, Essen Climate Evaluation Schema; HADS, Hospital Anxiety and Depression Scale; CVTRS, Corrections Victoria Treatment Readiness Scale. \**p* < .05. \*\**p* < .01. \*\*\**p* < .001.

AQ50, HADS and CVTRS scores at a descriptive level, there were no other variables that significantly differed between the two research sites.

Further descriptive statistics and independent samples *t*-tests were used to investigate whether any significant differences were present between those above and those below the clinically significant threshold for the AQ50 (Baron-Cohen et al., 2001). Of the total number of participants, 22.6% (*n* = 40) scored 32 (or above) out of 50 on the AQ50. Of those, only 10 self-reported a pre-existing diagnosis of Autism Spectrum Disorder (ASD), Asperger's Syndrome, High Functioning Autism, Autistic Disorder, or Pervasive Developmental Disorder (PDD). As presented in Table 4, participants above the AQ50 threshold scored lower on the EssenCES and lower on the CVTRS compared to those below the threshold, though not significantly so. However, an independent samples *t*-test did identify that participants above the AQ50 pseudo-diagnostic threshold scored significantly lower on the CVTRS Efficacy subscale. Moreover, an independent samples *t*-test demonstrated a significant difference between groups with regards to scores on the HADS, with significantly higher anxiety and depression levels in those scoring above pseudo-diagnostic threshold on the AQ50.

**Table 4.** Descriptive statistics and *t*-test values for total scores on EssenCES, HADS and CVTRS, comparing those above and below the AQ50 pseudo-diagnostic threshold score.

	AQ ≥ 32	AQ < 32	<i>t</i>	<i>p</i>	<i>d</i>
EssenCES	26.19 (10.20)	29.48 (11.38)	-1.64	.102	-0.30
Cohesion	8.12 (4.31)	9.21 (4.59)	-1.34	.184	-0.25
Safety	10.19 (5.05)	11.55 (4.66)	-1.60	.111	-0.28
Support	7.89 (4.59)	8.72 (4.69)	-0.99	.322	-0.18
HADS	25.10 (8.15)	15.46 (9.28)	5.93	<.001***	1.10
Anxiety	14.10 (4.30)	8.50 (5.44)	-6.80	<.001***	1.08
Depression	11.00 (4.75)	6.96 (4.62)	-4.84	<.001***	0.87
CVTRS	77.77 (11.45)	78.51 (11.81)	-0.35	.729	-0.06
Attitudes and Motivation	24.92 (4.42)	24.81 (4.53)	-0.13	.896	0.03
Emotional Reactions	23.99 (4.89)	23.66 (4.81)	-0.38	.708	0.07
Offending Belief	15.64 (4.15)	15.45 (4.44)	-0.24	.814	0.04
Efficacy	13.23 (2.51)	14.58 (2.78)	2.76	.006**	-0.49

Note. AQ50 = Autism Quotient 50; EssenCES = Essen Climate Evaluation Schema; HADS = Hospital Anxiety and Depression Scale; CVTRS = Corrections Victoria Treatment Readiness Scale. \**p* < .05. \*\**p* < .01. \*\*\**p* < .001.

**Table 5.** Zero-order correlations (Pearson's  $r$ ) between total scores on the AQ50, EssenCES, HADS and CVTRS measures.

	AQ50	EssenCES	HADS	CVTRS
AQ50	–			
EssenCES	–.21**	–		
HADS	.60***	–.49***	–	
CVTRS	–.20**	.23**	–.35***	–

Note. AQ50 = Autism Quotient 50; EssenCES = Essen Climate Evaluation Schema; HADS = Hospital Anxiety and Depression Scale; CVTRS = Corrections Victoria Treatment Readiness Scale. \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

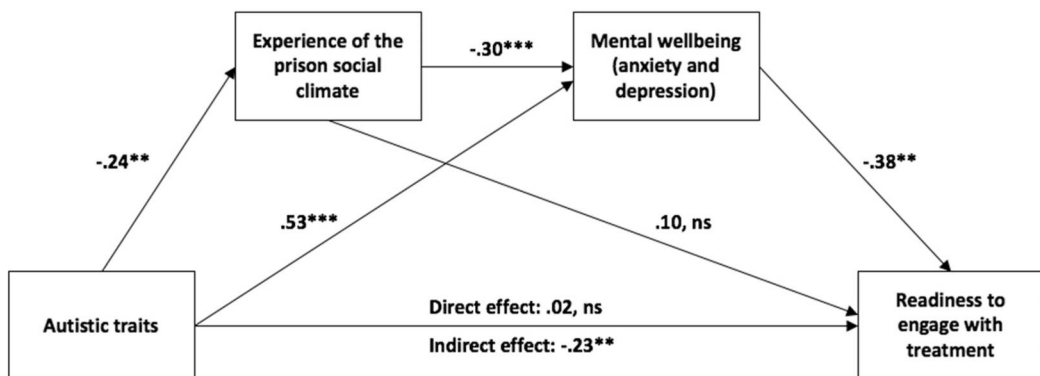
## Correlations

A bivariate correlation analysis was conducted, and significant correlations were identified between scores on all measures (see Table 5). A negative correlation between scores on the AQ50 and EssenCES suggested that individuals with higher autistic traits had poorer experiences of the prison social climate. A moderate negative correlation found between scores on the EssenCES and the HADS, suggested that higher levels of anxiety and depression were associated with more negative experiences of the prison social climate. Finally, there was a negative correlation between scores on the HADS and CVTRS, indicating that those with higher levels of anxiety and depression typically felt less ready to engage in treatment. We also observed a significant moderate positive correlation between scores on the AQ50 and HADS, suggesting a relationship between autistic traits and the experience of anxiety and depression, and a positive correlation between the EssenCES and CVTRS, suggesting that individuals with more positive ratings of the prison social climate were more inclined to exhibit treatment readiness.

## Double-Mediation analysis

A double mediation analysis was conducted on the data, using the PROCESS macro (Model 6) in SPSS. Model 6 is capable of testing for direct and indirect effects of a focal predictor variable ( $X$ ) on an outcome variable ( $Y$ ), with the integration of two mediator variables ( $M^1$  and  $M^2$ ). Throughout this section,  $b$  refers to unstandardised beta-weights within the double mediation model.

As demonstrated in Figure 2, the direct effect of autistic traits on readiness to engage with treatment was not statistically significant ( $b = 0.02, p = .859$ ). However, they were significantly predictive of lower (i.e. more negative) perceptions of the prison social climate ( $b = -0.24, p = .004$ ). In turn,



\* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$

**Figure 2.** A double-mediation model testing for direct and indirect effects leading from autistic traits to readiness to engage with forensic treatment via the experience of the prison social climate and mental wellbeing (anxiety and depression). \* $p < .05$  \*\* $p < .01$  \*\*\* $p < .001$ .

such perceptions of the climate were not significantly predictive of readiness to change ( $b = 0.10, p = .253$ ).

Autistic traits were significantly and positively associated with higher levels of anxiety and depression ( $b = 0.53, p < .001$ ). Further, poorer ratings of the prison social climate predicted higher levels of anxiety and depression ( $b = -0.30, p < .001$ ). Higher levels of anxiety and depression predicted lower scores on the readiness to engage with treatment ( $b = -0.38, p = .001$ ).

Finally, the indirect double mediation effect that we hypothesised, with autistic traits predicting readiness to change via both perceptions of the prison social climate and anxiety and depression symptoms was statistically significant ( $b = -0.23, p = .009$ ).

## Discussion

This novel study addressed a gap in the existing literature by investigating associations between autistic traits and readiness to engage with treatment interventions among individuals with sexual offence convictions, and the mediating roles of prison climate experience and mental wellbeing. It was found that while autistic traits alone did not significantly predict readiness to engage with interventions, the relationship between these two variables was mediated by both experiences of the prison social climate and mental wellbeing. Consistent with our hypotheses, participants with higher levels of autistic traits tended to have a poorer experiences of the prison social climate, which, in turn, predicted higher levels of anxiety and depression, which subsequently predicted a reduced level of readiness to engage with forensic interventions.

## Interpretation of findings

Prison social climates have been largely understood as inherently relational social phenomena constructed of dimensions such as inmate cohesion, staff-prisoner relationships and perceived safety (Mann et al., 2019; Schalast et al., 2008). Therefore, it is understandable that autistic traits in this study were negatively associated with perceptions of the prison social climate, particularly regarding social interactions and relations with others (see APA, 2022; Newman et al., 2015; Vinter et al., 2020, 2023). For instance, interpreted in light of existing literature on autistic experiences of prisons (Newman et al., 2015; User Voice, 2023; Vinter et al., 2020), it is plausible that neurodivergent prisoners may be more likely to be socially marginalised and isolated compared to neurotypical prisoners because they behave, communicate and/or interact differently to neurotypical peers, and that those neurotypical peers respond negatively due to limited understanding, acceptance and/or compassion towards those differences (see the double-empathy problem; Milton, 2012; Mitchell et al., 2021). The double-empathy problem suggests that communication difficulties experienced by neurodivergent individuals stem from being misunderstood and miscommunicated with by neurotypical individuals, *as well as* neurodivergent individuals misunderstanding others. As such, within the prison context, neurodivergent individuals may be actively socially excluded by other neurotypes or may self-isolate to avoid encountering difficulties in the social environment (Helveschou et al., 2018; Newman et al., 2015; Vinter et al., 2020). Although some autistic prisoners have found themselves to be more social in the prison compared to how they tended to live their life before incarceration, their prison-based friendships are normally isolated to individuals or tight-knit groups, and trust can be difficult to establish (Vinter et al., 2020; Vinter et al., 2023). Therefore, feelings of cohesion with the broader prisoner population of their wing or the whole establishment may not be as strong. These difficulties may be further compounded for those with sexual convictions when considering the typical offence-based hierarchies reported in mainstream prison settings (Blagden et al., 2017, 2019), where those with sexual convictions are viewed as being at a low level of social standing. Taken collectively, combining difficulties experienced in social interactions and the hostile environment of many prison settings, neurodivergent individuals may be more likely to experience confrontations with other prisoners in the prison, as supported by previous research (National Autistic

Society, 2011; Talbot, 2009; Vinter et al., 2020). However, this latter argument is not necessarily supported in the current dataset. Future research would be beneficial to confirm if neurodivergent prisoners are statistically more likely to encounter confrontations with other prisoners, and to identify strategies of how to address this issue in practice.

The association found between autistic traits and ratings of the prison social climate may also relate to a reciprocal lack of understanding between neurodivergent prisoners and prison staff. Neurodivergent prisoners often encounter misunderstandings with prison staff in relation to their autism and how they should be managed, which some have attributed to poor autism awareness in the prison system (Ashworth, 2016; Newman et al., 2019; Vinter et al., 2020). If neurodivergent prisoners feel misunderstood, marginalised and are not receiving the right support for them, they may feel that staff are not as interested in their development and wellbeing (see e.g. Mann et al., 2013; Ricciardelli & Moir, 2013). This emphasises the need for more autism-specific support provisions and neurodiversity awareness building in prisons, with the current study suggesting that this could have positive effects on both the subjective wellbeing of prisoners and their readiness for treatment.

The positive association in this study between autistic traits and mental wellbeing was unsurprising, given the common co-occurrence of autism, anxiety and depression (Bleil Walters et al., 2013; Hollocks et al., 2019). A relationship between perceived social climates and subjective wellbeing levels was anticipated (for a discussion of these relationships, see Blagden et al., 2019; Mann et al., 2019). However, of significance here was the mediating effect of anxiety and depression levels on participants' readiness to engage with treatment. That is, autistic traits alone were not directly associated with treatment readiness, but were instead indirectly associated with treatment readiness through the effects of perceived experiences of the prison social climate on wellbeing. This is understandable when contextualised in the heterogenous OBP experiences described by autistic individuals in prior qualitative work (Vinter et al., 2023), which contributes to a reluctance to engage with staff in formal treatment contexts. The varied experiences of the prison environment (and sometimes of treatment programmes themselves; Vinter et al., 2023) contribute to increased anxiety, potentially contributing to autistic individuals' disengagement with the broader prison regime and their treatment plans. Here, broader staff education within the prison about autism and neurodiversity becomes especially pertinent, as non-engagement with OBPs may have a range of negative implications for risk assessment and parole recommendations, particularly if staff perceive non-engagement as antisociality rather than an autism-related coping response. Therefore, findings here suggest perhaps a need to more deeply consider a neurodivergent individual's broader prison experience to contextualise case formulations and treatment engagement issues (particularly experiences of the prison social climate), a need for more comprehensive staff training with regards to supporting neurodivergent individuals' engagement in prison-based rehabilitation, and that broader provisions in prisons to support neurodivergent prisoners' wellbeing could be conducive to treatment engagement.

### *Limitations and future directions*

An important limitation in this study was the number of incomplete responses, which led to a need to impute missing data. Although rigorous methods were used to deal with this (i.e. checking that data were MCAR, and using a robust imputation method), we noted some additional handwritten comments on questionnaires from participants indicated potential limitations with the measures themselves. For example, some of the more commonly missed items referred to views about a participant's offending behaviour. However, several participants refused to answer these items, and left comments wherein they denied their offences and claimed to have been wrongly convicted. Another commonly incomplete item was "I am upset about being a corrections client". Several comments indicated that this was due to the use of the term "corrections client", which is not commonly used in the UK. As such, some participants were unsure of its meaning, and did not feel able to

answer. Future replications of this work might look at other measures of treatment readiness (for a discussion, see Mossière & Serin, 2014), or adjust the CVTRS to be more responsive to the language used in UK prisons. It may be beneficial for such amendments to be co-produced with current prisoners, to ensure that the language resonates with those to whom it relates – relatedly, it would be beneficial to consider the prevalence of learning difficulties in prisons in re-framing the language to be more accessible within self-report scales such as these.

A second limitation of this study was that it did not consider the participants' experiences of the prison physical-sensory environment as a facet of the main model, focussing instead on the prison social climate. However, prior work has indicated the potential impact of the sensory environment on anxiety and stress levels (Higgs & Carter, 2015; Vinter et al., 2020, 2023). Therefore, it may be that experiences of the sensory environment of a prison are also impactful on autistic individuals' mental wellbeing and/or treatment readiness in prisons. These could be captured in future research as an additional dimension of the prison experience, for example, a considerably modified version of the Glasgow Sensory Questionnaire (GSQ; Robertson & Simmons, 2013) could be adapted for application in prison settings. Alternatively, a bespoke quantitative measure of prisoner experiences of the prison sensor environment could be developed and validated for use in prison settings.

The use of the AQ50 to capture autistic traits may also be considered a limitation. The AQ50 has been associated with validity issues in existing literature (Ashwood et al., 2016; Murphy, 2011). It has been suggested that the AQ50 may inadvertently capture traits that are common features of other conditions, such as generalised anxiety disorder (Ashwood et al., 2016), or are otherwise common in forensic or institutionalised populations, unrelated to neurotype, such as a preference for routines and difficulties with perspective-taking (Murphy, 2011). Therefore, as the present study was prison-based, it is possible that the AQ50 perhaps lacked sufficient discriminative validity to distinguish individuals with higher genuine autistic traits from others who possessed similar, but nonetheless not autism-related, traits. Therefore, some individuals who scored highly on the AQ50 in this study may simply have possessed autism-like traits, but those traits were perhaps attributed to other conditions or characteristics. Consequently, utilising (or corroborating AQ50 scores with) alternative autism-related screening tools (e.g. The Ritvo Autism Asperger Diagnostic Scale- Revised [RAADS-R], Ritvo et al., 2011) may be more appropriate means of capturing autistic traits in future prison-based research of this kind.

Finally, ratings of prison social climates were found to be significantly lower in this study than what would be expected in UK prisons housing similar populations (e.g. Blagden et al., 2016; Blagden et al., 2017). However, it was not immediately clear why this was the case in the current study. The significant differences between participants' ratings of the prison social climates in this research and UK prison statistical norms for the EssenCES (Schalast & Tonkin, 2016; Tonkin et al., 2012) may represent an underlying limitation(s) with this study. For example, the sample taken from each prison may not be entirely representative of the prevailing experiences in those prisons due to self-selection biases. Additionally, it is also possible that mentions of autism in the questionnaire packets led some prisoners to self-exclude from the study. Future replications of this work might look to ensure the representativeness of the sample is maximised so as to be more confident in the extent to which climate data reflects the broader experiences of the prisons being used as recruitment sites.

## Conclusions

To conclude, existing prison climate literature has posited that one element of a prison social climate relates to how well the psychological and physical needs of prisoners are understood, accommodated and supported (Tonkin, 2016). Findings from the present study suggested that neurodivergence may be one such psychological need, which needs to be considered and accommodated in the development of a prison's rehabilitative culture. The significant implications of this study are that neurodivergent prisoners may have different perceptions of the prison social climate compared to neurotypical prisoners, which ultimately impacts their mental wellbeing and readiness to



engage with interventions. Therefore, resonating with existing calls for improved support systems for neurodivergent people in UK prisons (CJJ, 2021; MOJ, 2022), this study provides an evidence base to justify the implementation of further social and mental health support provisions for neurodivergent prisoners, to encourage and support their participation in interventions.

## Notes

1. As this measure was distributed as a self-report questionnaire to prison populations, in which many residents may have intellectual, literacy, or language comprehension difficulties, one item on the scale was adjusted slightly to accommodate the needs of such residents. A brief clarifying definition was added to Item 48 "I am a good diplomat.", so that it read "I am a good diplomat. (A diplomat is a person who is good at dealing with people and settling arguments between people)".
2. As the prisons involved in this research hold a large proportion of individuals with Intellectual and Developmental Disabilities (IDDs) and other reading or literacy difficulties; materials were adapted to be sensitive to the needs these individuals. For example, text on information sheets utilised simplified language and was made easier to visually digest by keeping paragraphs short and widely spaced. Relatedly, after due consideration of the needs of individuals with IDD, and consultation with a member of the IDD team in one prison, it was decided that a total of 101 items across all four scales was an appropriate number. It was decided that this would strike the balance between ensuring a sufficiently rich data set, while avoiding overloading participants with too many items.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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