Research Brief

Environmental influences on perceptions of correctional climate: A multilevel modelling analysis

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AIMS This study aimed to explore the extent to which perceptions of correctional climates among people in prison are influenced by shared experiences of their environment, and what organisational and contextual factors might have a role in shaping those experiences.

FINDINGS AND CONCLUSIONS The sample for this study was 2,693 men and women housed in 27 correctional centres across New South Wales (NSW). Participants completed a survey via in-cell digital tablets which measured key dimensions of correctional climate including perceptions of procedural fairness, relationships with staff, and experienced safety.

Data were primarily analysed using multilevel modelling. This is a regression technique which can be used to accurately estimate higher-order effects under conditions where individuals are clustered into units, in this case correctional centres.

Model results indicated that significant amounts of variance in each of our measures can be explained by differences across correctional centres. Variance explained at the centre level ranged from 6.74% for procedural fairness to 10.67% for safety. After entering predictors into the models, all measures of correctional climate were significantly associated with centre inmate population size. Respondents who were at centres with larger inmate populations gave less favourable ratings on all measures compared to respondents at centres with smaller populations. At the individual level, age, time in custody, Aboriginal cultural background, gender, and being remanded or sentenced were each associated with differences in ratings of one or more dimensions of climate.

We concluded that while most variance in perceptions of correctional climate relate to differences in individuals' pre-existing characteristics and adjustment to prison, there is evidence that these perceptions are also significantly influenced by their shared environment. This has promising implications for the validity of our measures in assessing prison climate and provides a foundation for exploring centre-level factors that contribute to variance, including inmate population size as illustrated in this study. Further research is needed to better understand environmental influences on prison climate that are under the control of corrections agencies and amenable to targeted change.

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INTRODUCTION

In recent years corrections agencies have increasingly focused on measuring, understanding and influencing prison climate. Prison climate refers to the social, emotional, organisational and physical characteristics of a correctional institution as perceived by people living and working in that environment (Ross et al., 2008). Research has indicated that the quality of a prison climate is associated with the level of order in correctional centres, with more positive climates associated with greater compliance and less violent misconduct (Bosma et al., 2020a; Day et al., 2011; Gadon et al., 2006), in addition to better wellbeing and other mental health outcomes for people in prison (e.g., Liebling & Ludlow, 2016; van Ginneken et al., 2019; van Ginneken & Nieuwbeerta, 2020). These factors have implications for how staff experience their workplace, with lead on effects for their wellbeing and job outcomes such as burnout and absenteeism (e.g., Eggert et al., 2014; Nichols et al., 2024). Good prison climates also share characteristics with rehabilitative climates, and there are indications that climate has an influence on inmates' readiness for change and engagement in treatment (Auty & Liebling, 2020; Day et al., 2011; Galouzis et al., 2023). The potential benefits of improving prison climate may become more pronounced in light of correctional agency trends towards professionalism of the workforce and adoption of rehabilitative objectives across many jurisdictions (Morrison & Maycock, 2020; Schoenfeld & Everly, 2020).

A recent study by van Ginneken and Nieuwbeerta (2020) identified four key properties of prison climate. First, it is a subjective phenomenon in that it reflects individuals' own perceptions and experiences of the characteristics of the prison. Second, it is a multidimensional construct with many factors contributing to perceptions, including relationships with staff and other inmates, safety and order, contact with the community, facilities and activities, and personal autonomy (Tonkin, 2015; Boone et al., 2016). Third, while perceptions are subjective there is expected to be some level of agreement between individuals in a given prison or unit, which is indicative of the influence of the shared environment on those perceptions. Fourth, prison climate exerts contextual effects on people's behaviour and other outcomes, independent of the effects of their individual characteristics.

The third condition stipulated by van Ginneken and Nieuwbeerta (2020) is notable because it represents a defining feature of what is referred to as 'climate', whereby characteristics of an environment result in perceptions or experiences that are shared among people located within that environment. While this is a presupposition of most prison climate research, there are challenges to quantifying such environmental influences empirically. People in prison are a heterogenous group, and differences in their individual histories, characteristics, and experiences are expected to have substantial effects on how they perceive the climate. Relevant criminological theory (e.g., Irwin & Cressey, 1962; Sykes, 1958) indicates that an individual's adjustment to prison is a function of importation (pre-existing characteristics an individual has when they enter the prison) and deprivation (conditions of the prison) factors, with available studies indicating that the majority of variation in behavioural outcomes is attributable to importation (e.g. Steiner et al., 2015). Moreover, individuals with certain characteristics often cluster within specific environments; for example, people housed in high security prisons may have histories of offending behaviour or institutional conduct that differ from people housed in lower security prisons. As a result, it can be unclear to what extent perceptions of a given climate reflect true environmental influences or the characteristics of people within that climate.

Historically, very little research has been conducted using suitable analytical techniques to establish and understand environmental influences on perceptions of prison climate (van Ginneken & Nieuwbeerta, 2020). Most analyses have treated prison climate at the individual level or as the sum of individual perceptions, which may bias estimates of how environmental factors influence outcomes as a result of sample clustering and other statistical artefacts. In recent years a series of studies have applied more sophisticated multilevel modelling techniques to examine the climate of prisons in the Netherlands (Bosma et al., 2020a; van Ginneken et al., 2019; van Ginneken & Nieuwbeerta, 2020; van Ginneken & Palmen, 2023), using a bespoke survey measure known as the Prison Climate Questionnaire (PCQ: Bosma et al., 2020b). They have found initial evidence for significant differences in how prison units and centres are perceived after accounting

for individual differences, with between 3-15% and 1-8% of variance in ratings across climate factors explained at the unit and centre levels respectively (van Ginneken & Nieuwbeerta, 2020). Further research has explored environmental influences that may account for this variance, including the experiences of staff working at the prison (van Ginneken et al., 2020). Other analyses from this group have indicated that differences in perceived climate across settings can exert context effects on individual outcomes, including wellbeing and misconduct (Bosma et al., 2020a; van Ginneken et al., 2019; van Ginneken & Nieuwbeerta, 2020).

AIMS

Corrective Services NSW (CSNSW) has identified strategic objectives to improve perceptions of correctional climate among people completing orders. This has been accompanied by a program of routine surveys with people in prison, which uses new and existing measures to tap into primary dimensions of prison climate including perceptions of procedural fairness, relationships with staff, and experienced safety (see Islam et al., 2024).

The available literature suggests that aims to improve prison climates are fundamentally supported by using appropriate research techniques to isolate and assess environmental influences. While individual differences in perceptions may give some insights into organisational factors that could potentially benefit from change, such as improved cultural or gender-based responsivity, it can be difficult to relate such differences to the role of corrections agencies as compared to pre-existing idiographic factors. By contrast, examination of environmental influences allows for a better understanding of what factors affect inmates' experiences that are within institutional control. As previously mentioned, statistical methods of isolating higher-order influences on perceptions are critical for accurately assessing differences in the performance of centres towards maintaining quality correctional climates and contributing factors, independent of the characteristics of individuals at that centre. We also recognise that measurement of prison climate continues to be a developing area (Tonkin, 2015) and testing the extent to which survey tools actually reflect shared experiences and features of the environment is important for establishing the validity of these measures in tapping into constructs that are relevant to climate (van Ginneken & Nieuwbeerta, 2020).

This study aims to apply advanced multilevel modelling techniques to assess how measures of perceived correctional climate adopted by CSNSW reflect shared characteristics of prisons as experienced by their residents. Applying a large sample of 2,693 inmate respondents to our survey on correctional climate from prisons across the state, our analyses first sought to estimate how much variation in ratings of procedural fairness, relationships with staff, and safety can be attributed to differences across centres. Subsequent analyses were also conducted to derive insights about which factors, at both the individual and correctional centre levels, have an influence on these perceptions.

METHODS

The sample for this study included 2,693 men and women who completed a survey on in-cell digital tablets. Sample demographics and other variables are given in Table 1. The average age of respondents at the time of completing the survey was 39.5 years. Among respondents almost 10% were women, and 30% identified as being of Aboriginal or Torres Strait Islander background. At the time of completing the survey, respondents had been located in their current prison for an average of more than 6 months (M = 230 days) and had an average prior lifetime experience of incarceration of more than 4 years (1667 days).

Data used in this study were mainly derived from a round of routine surveys conducted by CSNSW to assess people's perceptions of correctional climate, which was administered between August and September 2024. A detailed description of the survey methods is given in Islam et al. (2024). In brief, links to online surveys hosted on the Alchemer platform were distributed to all people in custody at correctional centres where there was common access to in-cell digital tablets. For this round, responses were recorded from a total of 27 correctional centres. Respondents were asked to complete a number of psychometric measures

pertaining to their experiences of correctional climate. These included a 10-item measure of procedural justice and a 5-item measure of subjective safety that have previously been established in the research literature (Barkworth & Murphy, 2021; Schalast et al., 2008). Respondents also completed a bespoke measure of staff relationships that was developed and validated by CSNSW (Islam et al., 2024) to assess the quality of relationships between people serving orders and staff with a focus on rehabilitative orientations and functions.

Table 1. Descriptive statistics of sample and study variables

Variable category	Variable	% / Mean (SD)
Level 1 – individual		
	Gender	
	Male	90.5%
	Female	9.5%
	Aboriginal background	
	Yes	30.2%
	No	69.8%
	Episode type	
	Sentenced	63.2%
	Remand	36.8%
	Age (years)	39.54 (12.35)
	Days spent at centre	230.82 (345.01)
	Days spent in prison	1667.59 (1851.93)
Level 2 - correctional centre		
	Security level	
	Open	29.6%
	Secure	70.4%
	Average population	451.26 (362.04)
	Time out of cells (hours)	8.25 (1.90)
Outcome variables		
	Procedural fairness	2.78 (1.06)
	Staff relationships	2.74 (1.07)
	Safety	3.64 (1.17)

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Respondents accessed the survey using their agency identifier number, which allowed for extraction of additional variables from the CSNSW Offender Integrated Management System (OIMS). OIMS is a comprehensive agency administrative database which is used to collate a range of information about people serving orders in custody and the community. Individual variables of interest extracted from OIMS included the respondent's age, gender, Aboriginal background, sentence type, time served over the index custodial

episode, and time served at the current correctional centre at the time of completing the survey. Aggregate OIMS data was also used to calculate correctional centre variables, including security level, average population, and average time spent out of cells over the month preceding the survey.

Respondents were excluded from the study if they had been transferred to a new correctional centre within 2 weeks of completing the survey, to ensure that responses reflected adequate experience of a particular centre and minimise the risk of data misallocation at the centre level. Survey measure outcomes were calculated as mean scores and were excluded from analyses if the respondent gave valid answers to less than 80% of items.

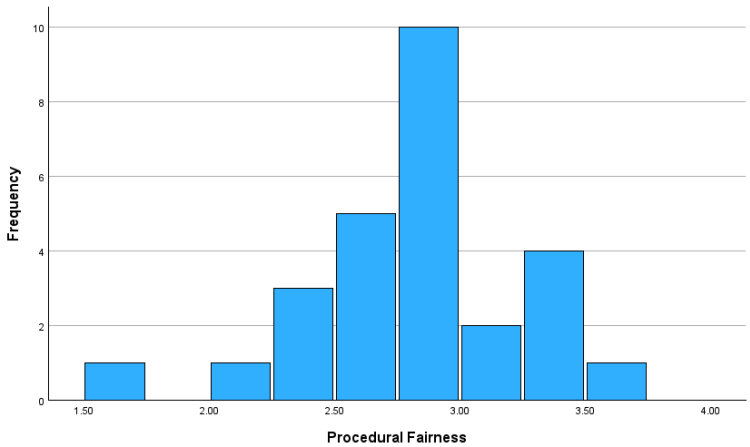
Primary analyses for this study involved multilevel modelling of the survey measures of correctional climate including perceptions of procedural fairness, relationships with staff, and safety. Multilevel model regression analysis is a robust method of estimating variance in an outcome which is influenced by factors that are organised by multiple hierarchical levels, and have some degree of dependence or nesting at the lower levels. In the case of this study, multilevel models were used to estimate variance in survey measures that could be attributed to individual differences and centre-level differences, accounting for the potential that respondents are nonrandomly clustered across correctional centres.

A series of separate multilevel models were estimated for each of the survey measures using HLM 8.2 (Raudenbush et al., 2011). First, a null or unconditional model was fitted to estimate the proportion of total variance in respondents' scores that could be attributed to differences at the centre level. A significant result for this model indicates detectable between-centre differences and justifies use of multilevel modelling for the data. Second, all predictor variables at Level 1 (individual) and Level 2 (centre) were entered simultaneously into the model to estimate their relationships with survey outcomes. Given the small sample at Level 2 we selected a limited set of predictor variables for parsimony. Relatedly, predictors were estimated as fixed effects and only the Level 1 intercepts were permitted to vary as random effects.

FINDINGS

Do perceptions of correctional climate vary across correctional centres?

Figure 1 shows the distributions of average scores on measures of procedural fairness, staff relationships and experienced safety across correctional centres in the sample, before accounting for the individual characteristics of respondents. It can be seen that average scores tended to be normally distributed across centres, giving a preliminary indication of variance in aggregate perceptions as a function of location. Among the three measures, experienced safety received higher average ratings compared to procedural fairness and staff relationships.



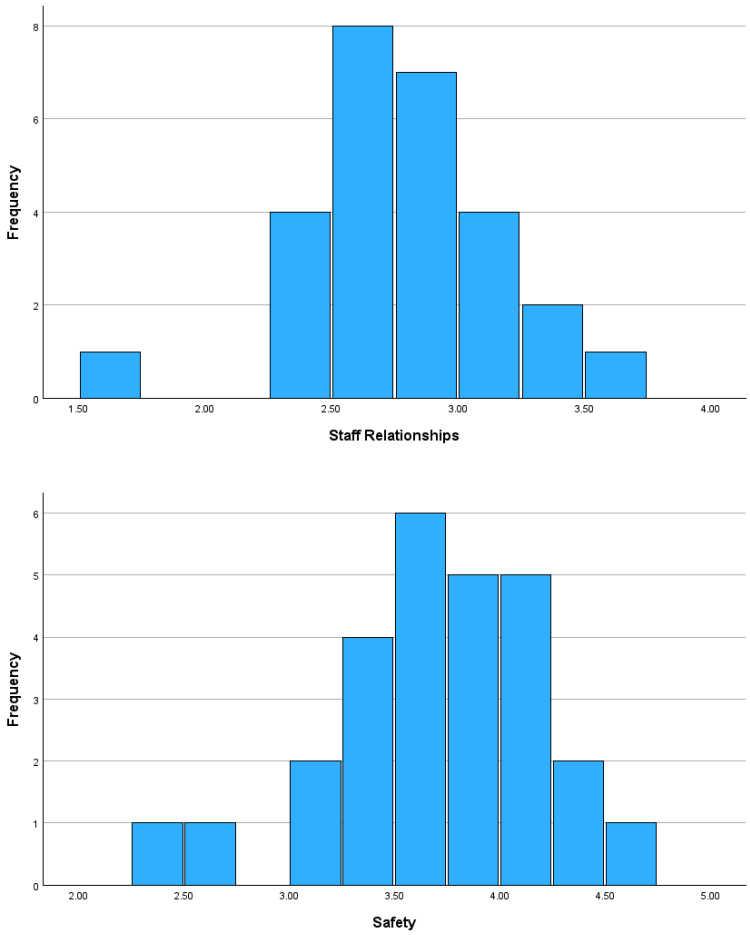


Figure 1. Correctional centre-level distributions of climate measures

To better understand levels of perceptual agreement across environments, we conducted a series of multilevel models for each of our measures of correctional climate. The first step of our multilevel modelling approach was to run unconditional models to establish whether there was significant variance in the measures across correctional centres, after accounting for individual differences. Significant variance components at Level 2 were found for each of the null models for measures of procedural fairness ($\chi^2(26) = 163.37$; $p < .001$), staff relationships ($\chi^2(26) = 154.37$; $p < .001$), and experienced safety ($\chi^2(26) = 254.67$; $p < .001$).

Intraclass correlation coefficient (ICC) statistics indicated that 6.74% of variance in scores on the procedural fairness measure was accounted for by differences across correctional centres, whereas the remaining 93.26% of variance was accounted for by differences between respondents. A similar pattern was observed for the staff relationships measure, with 6.76% of total variance explained by between-centre differences and 93.24% of variance explained by individual differences. The ICC values for the safety measure indicated relatively greater centre-level variance, with 10.67% of total variance explained at the centre level and 89.33% explained at the individual level.

What are the individual-level and centre-level predictors of perceptions of correctional climate?

A summary of results for full models incorporating both Level 1 and Level 2 predictors of respondents' ratings on measures of correctional climate are given in Table 2. Beta coefficients can be interpreted so that values greater than zero indicate a positive association between the variable and more favourable perceptions of correctional climate, and values less than zero indicate a negative association between the variable and perceptions. Results were interpreted as statistically significant at alpha values of $p < .05$.

Table 2. Multilevel model results for correctional climate measures

Variable	Procedural Fairness		Staff Relationships		Safety	
	β (SE)	p	β (SE)	P	β (SE)	p
Level 1						
Episode type	-.102 (.049)	.039	-.085 (.050)	.087	.180 (.055)	.001
Gender	-.492 (.183)	.007	-.772 (.185)	<.001	-.308 (.204)	.130
Aboriginal	-.036 (.045)	.431	-.056 (.046)	.222	.118 (.050)	.020
Age	.016 (.001)	<.001	.013 (001)	<.001	-.002 (.001)	.128
Days at centre	.00001 (.00006)	.865	.00003 (.00006)	.605	-.0003 (.0007)	.661
Days in custody	-.00006 (.00001)	<.001	-.0007 (.0001)	<.001	-.00001 (.00001)	.950
Level 2						
Security level	-.226 (.164)	.181	-.190 (.160)	.247	.063 (.212)	.769
Average population	-.0005 (.0001)	.007	-.0006 (.0001)	.003	-.0007 (.0002)	.005
Time out of cells	.018 (.038)	.626	.032 (.037)	.391	.021 (.050)	.677

For the procedural fairness measure, a number of factors accounted for significant differences across individuals. After adjusting for other predictors, people who were on remand at the time of completing the survey gave significantly higher ratings of procedural fairness than those who were sentenced. Women tended towards significantly more favourable perceptions compared to men. Age was positively associated with ratings, so that perceptions improved as the respondent's age increased. Conversely, respondent's perceptions of procedural fairness declined the longer they had spent in custody at the time of completing the survey. At the centre level, only average population was significantly associated with ratings. Respondents who were at centres with larger populations tended to have poorer perceptions of procedural fairness than those at centres with smaller populations.

A similar pattern of findings was observed for the staff relationships measure. At the individual level, perceptions of relationships with staff significantly improved with the respondents' age, and declined as a function of the time the respondent had spent in custody. Women gave significantly better ratings of staff relationships compared to men. People on remand also gave marginally higher ratings of relationships than those serving custodial sentences. At the centre level, average population size had a significant negative association with respondents' perceptions of staff relationships.

For the experienced safety measure, a smaller set of variables were found to predict significant variance in outcomes. Aboriginal respondents and people who were serving custodial sentences reported higher perceptions of safety compared to non-Aboriginal respondents and people on remand. At the centre level, average population again had a negative association with outcomes, so that respondents at centres with larger populations reported lower levels of experienced safety compared to those at centres with smaller populations.

CONCLUSIONS

The aim of this study was to apply multilevel modelling techniques to explore how people's perceptions of correctional climate are influenced by shared experiences of the environmental features of their prison. Results showed that significant amounts of variance in ratings of procedural fairness, relationships with staff, and experienced safety were explained by differences between correctional centres. This provides a positive indication that the correctional centre in which an individual is housed has measurable bearing on their perceptions of prison climate, with the implication that some centres perform better than others on the assessed constructs after taking into account individual differences in the cohorts of people housed at those centres.

Variance explained at the centre level was relatively modest, at 6-7% for procedural fairness and staff relationships, and 10-11% for experienced safety, which is consistent with other studies of prison climate

(van Ginneken & Nieuwbeerta, 2020) and organisational climate more broadly (James, 1982). This suggests that perceptions of prison climate can be largely conceptualised as ideographic and driven by the individual's pre-existing characteristics and adjustment to the environment, as compared to common group experiences of the environment. Nonetheless, given that the limited variance in shared experience of prison climates has been found to exert significant context effects on outcomes such as wellbeing and misconduct (Bosma et al., 2020a; van Ginneken et al., 2019; van Ginneken & Nieuwbeerta, 2020), there remains a case for corrections agencies to identify and address environmental factors that contribute to those perceptions.

Amounts of shared variance were similar for ratings of procedural fairness and staff relationships, likely reflecting the high correlations between these scores and highlighting the importance of relational factors in how people perceive fair treatment in corrections contexts. By comparison, differences between centres accounted for a greater proportion of variance in experienced safety. While relationships with staff have been identified as a critical factor in the quality of prison life (Liebling, 2011), they may operate as micro-environmental effects that vary across individuals depending on the specific nature of their interactions or the staff involved. Research on procedural fairness has also emphasised the importance of prior interactions with justice agents and pre-existing attitudes about the legitimacy of authority on subsequent perceptions (van Hall et al., 2023). In contrast, perceptions of safety may be more likely to be influenced by common experiences such as exposure to visible incidents of violence and victimisation, which in turn have been associated with variation in the environmental conditions of prisons (e.g. Howard et al., 2019).

This study also provided initial insights on environmental factors that may influence perceptions of prison climate. Average prison population was consistently associated with ratings so that as population size increased, individual perceptions of procedural fairness, relationships with staff, and experienced safety at the centre all declined. Population size has been similarly associated with behavioural indicators of prison order such as misconduct (Wooldredge & Steiner, 2014). Increasing prison population has been linked to lower institutional capacity for control, where staff could have fewer opportunities to regularly communicate with or provide oversight to individual inmates, or there are fewer resources available for remunerative controls such as allocation of employment or program options (Griffin & Hepburn, 2013; Steiner, 2009).

Conversely, perceptions of prison climate were not associated with security level or routine time out of cells allocated to inmates at their centre. More secure centres have previously been identified as having poorer climates (e.g. Camp et al., 2003; Islam et al., 2024; van Ginneken et al., 2018) although this may often be attributable to the behavioural challenges or other characteristics of inmates who tend to be housed in these environments (Wooldredge & Steiner, 2014), highlighting the utility of hierarchical modelling techniques such as those used in the current study. One potential implication of this finding is that CSNSW may be relatively successful in balancing the security demands of managing such individuals while retaining other key elements of quality prison climates in higher security centres. Regarding time out of cells, this variable may have a complex relationship with perceived climate depending on factors such as availability and engagement in meaningful activities like employment and the risk of exposure to harm from others in shared spaces (Howard et al., 2019). It is also noted that this study was conducted parallel to progressive rollout of in-cell digital tablets across NSW correctional centres, which may have transformative effects on how people spent their time in cells and how they relate to both staff and other inmates while out of their cells (Barkworth et al., 2024). Further study would be beneficial to understand how differences in the qualitative nature of time out of cells is related to shared experience of prison climate.

While not central to the aims of this study, our analyses also gave insights about how individuals differ in their perceptions of correctional climate independent of their specific location. People on remand held more favourable views of procedural fairness and relationships with staff but felt less safe than people who had been sentenced, which is consistent with other research (e.g., Islam et al., 2024; in prep.) and may suggest benefits in improved induction processes and environments for people entering prison prior to sentencing. Whereas age was positively associated with perceptions of staff relationships and procedural fairness, more time spent in prison over the lifespan was negatively associated with these perceptions. This pattern may partly be a function of increased risk and underlying factors such as antisocial attitudes, which are often characterised by poorer views of the legitimacy of justice and other authority figures (Howard & van Doorn,

2018; van Hall et al., 2023; Walters, 1995), among younger inmates and those with longer criminal histories. Notably, Aboriginal respondents and women gave significantly more favourable ratings on some dimensions of correctional climate (see also Islam et al., in prep.), which has positive implications for agency efforts to promote cultural safety and responsiveness to gendered needs.

Some limitations of the study are noted. A main limitation was the small sample of sites available for analysis at the centre level, which necessitated inclusion of a parsimonious set of predictors at that level and may have affected the sensitivity of estimates. One potential avenue for future research may be to estimate environmental effects at the sub-centre unit level, which has previously been found to explain meaningful variance in perceptions of prison climate (van Ginneken et al., 2019; van Ginneken & Nieuwbeerta, 2020). However, it is noted that various organisational elements that are relevant to climate in NSW prisons are nonetheless expected to operate at the centre level; an expectation that is reinforced by the findings of this study. Higher-order sample sizes may also be improved with the progressive rollout of tablets and other administration methods across NSW prisons in future surveys. A related limitation is that measures of climate are derived from self-report and subject to selection and response biases. While evidence for shared perceptions of climate has positive implications for the construct validity of measure outputs, it would also be beneficial to explore correspondence with other objective proxies for climate such as the incidence of violent misconduct within a prison.

In sum, the results of this study demonstrated that our measures of correctional climate, relating to perceptions of procedural fairness, relationships with staff, and experienced safety, vary significantly across prisons after accounting for differences in the individuals housed at those prisons. It adds to the very limited literature testing a key definitional condition of prison climate, in that it involves shared experiences that are influenced by features of the environment (van Ginneken & Nieuwbeerta, 2020). In doing so, our study gives initial insights into the extent to which perceptions are influenced by the performance of the centre, and environmental variables that have a role in shaping those perceptions. More research is needed to further understand organisational and contextual factors that have aggregate effects on how people experience correctional climates and are amenable to change initiatives by corrections agencies.

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