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The Influence of Perceived Prison Crowding on Male Inmates' Perception of Aggressive Events

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This study examines whether, in a male prison, the subjective experience of crowding increases the likelihood that events are perceived as aggressive in nature, and whether the protagonists involved are viewed as more hostile, malevolent, and aggressive. In addition, this paper also examines the possible mediating effects of stress, arousal, and psychological well-being on two hypothesised relationships. First, these mediating factors are examined for the link between individuals' personal space preferences and their perceived level of crowding. Second, these factors are examined for the link between perceived crowding and interpretations of an aggressive event. Such associations may help to explain why crowding and aggression are linked within a social interactionist perspective. The results confirmed previous findings that crowding is linked to increases in arousal and stress, and a reduction in psychological well-being. This study also found, however, that those inmates who experienced crowding were also more likely to interpret behaviour as aggressive and violent. This relationship was not mediated by arousal, stress, or psychological well-being. However, these factors were found to partially operate in the relationship between personal space preferences and the experience of subjective crowding. The implications of this study for social interactionist explanations of the link between crowding and prison violence are offered. Aggr. Behav. 30:273–283, 2004. © 2004 Wiley-Liss, Inc.

Keywords: prison crowding; arousal; stress; personal space; perceived aggression

INTRODUCTION

Aggressive and violent behaviour in prisons is a significant problem for penal systems around the world [Logan et al., 2001; Useem and Goldstone, 2002; Wood and Adler, 2001]. The current research examines whether in such crowded and problematic environments, the subjective experience of crowding increases the likelihood that events will be perceived as more aggressive in nature, and whether the protagonists involved will be viewed as more hostile, malevolent, and aggressive. Such an association may help to explain why crowding and aggression are linked within a social interactionist perspective. This paper also examines the possible mediating effects of stress, arousal, and psychological well-being.

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Various reasons for such prison violence and aggression have been suggested. Problematic management strategies [McCorkle et al., 1995], the prevalence of substance abuse [Logan et al., 2001], and the existence of violent subcultures [Ireland, 2000], have all been proposed as possible causes. The relationship between aggressive behaviour and crowding, however, has been well established in prison contexts [Cox et al., 1984; Lester, 1991; Paulus and McCain, 1983; Porporino, 1986], and other environments, including psychiatric units [Ng et al., 2001], and in the home [Evans and Lepore, 1993]. The literature, however, is more equivocal about the reason for this link. It has been suggested that those who are subjected to crowded conditions, and also lack a social support network, may become more prone to distress [Lepore et al., 1991]. This distress may then, in turn, be linked to increases in aggression, although this mechanism is not specified. Also, social identity influences have been suggested as a factor in supporting the exhibition of violence and non-violence in crowded situations [Stott et al., 2001], particularly in cases in which the crowd's activities are normatively associated with aggression.

Social interactionist perspectives on aggression and violence, however, have more recently emphasised the impact of participants' perceptions and interpretations of the aggressive event, as well as the motivations and intentions of others involved in the incident [Lawrence and Leather, 1999a, b, 2003]. Lawrence and Leather [1999b, 2003] for example, showed that environmental conditions can influence the extent to which individuals interpret aggressive or ambiguous behaviours as being malevolent, hostile, and intentional in nature. Evidence also suggests that when individuals interpret others' behaviour as hostile, they are more likely to then feel aggrieved, and retaliate [Tedeschi and Felson, 1995].

In order to examine the impact of crowding and aggression, it is important to consider (i) the degree to which individuals perceive themselves to be living under crowded conditions, and (ii) their own personal space preferences. This is particularly pertinent when considering the link between violence and crowding. Previous research has highlighted the increase in personal space preferences among violent offenders [Hildreth et al., 1971], particularly among those also scoring higher on relevant dimensions such as psychoticism [Eastwood, 1985]. Any examination of crowding must address this subjective preference for personal space. This will differ across individuals, and will be a pertinent variable for those within a prison population. The current research is conducted within a large UK local medium to high security prison. These are prisons that receive prisoners directly from court, either on remand or newly sentenced. Local prisons as a whole have been described by HM Inspector of Prisons as "the most overcrowded, on average holding 26% more prisoners than they are resourced to do" [Annual Report 1997–1998 of HM Chief Inspector of Prisons: p.10].

Relationships between personal space preferences, crowding, and the perception of aggression may not be direct. Rather, several possible mediating factors have been identified. Firstly, it may be that the experience of crowding is not an inevitable outcome of an individual having a large personal space zone. Such a relationship may be mediated by stress or arousal the individual is experiencing, either at the time or chronically [Worchel and Hunter Brown, 1984].

Secondly, the experience of arousal and stress may also mediate the relationship between crowding and the perception of aggressive events. Higher levels of arousal have been associated with both the exhibition of aggression [Anderson and Bushman, 2002; Knight et al., 2002] and the experience of crowding [Worchel and Hunter Brown, 1984]. In addition, the experience of stress has been associated with aggressive responses according to cognitive

neoassociation approaches [Berkowitz, 1993]. This theoretical view suggests that the experience of stress triggered by aversive environmental characteristics automatically activates negative or aggressive thoughts and memories, and will evoke related aggression-related constructs, thus increasing the likelihood of hostile interpretations of events. Therefore, any link between crowding and the hostile attributions of aggressive events may simply be due to an increase in arousal or the experience of environmental stress. For the purposes of this study, arousal will be measured subjectively by the participants using the Stress Arousal Checklist [SACL, Mackay et al., 1978], rather than via any physiological markers. The SACL has been validated in previous work which showed consistent associations between SACL scores and physiological responses to stress and arousal (e.g., levels of salivary lysozyme [Perera et al., 1997]). The SACL measures state rather than trait levels of arousal, and so is relevant to this study, as the impact of crowding on arousal is of interest.

Finally, crowding has been associated with lower psychological and physiological well-being [Lepore et al., 1991]. For example, the rate of suicide in prisons has been seen to increase as overcrowding increases [Lester, 1991]. In addition, Evans and Lepore [1993] have illustrated that the link between the experience of crowding and psychological distress can lead to social withdrawal. This increase in withdrawal from social interactions with others may be associated with a corresponding increase in attributing aggressive or hostile intentions to the actions of others. In addition, psychological distress has been associated with the exhibition of aggression [Anderson, 2002]. It is also well established that depressed individuals generate more negative attributions for the behaviour of themselves and others [Buchanan and Seligman, 1995]. Therefore, this study will also examine the extent to which psychological well-being mediates any relationship between crowding and aggressive attributions about the behaviour of others. Well-being is measured here using the General Well-Being Questionnaire, which examines psychological and physiological health over the previous six months. As health fluctuates less rapidly than arousal, it is assumed that this measurement is appropriate for the current study [Headey and Wearing, 1989].

The main aims of the study are as follows. Firstly, this paper examines whether male prison inmates experiencing crowding can influence the way in which the behaviour of others is perceived, using a subjective perception of crowding questionnaire, and their responses to a written account of a violent episode. According to cognitive neo-association models of aggression, it is predicted that individuals who experience crowding will make more aggressive attributions about the behaviour of other individuals.

Secondly, this study also measures participants' preferences for personal space using a version of the stop-distance technique [see, for example, Eastwood, 1985], in order to examine the extent to which perception of crowding is related to personal space zones of inmates. It is expected that increased personal space preference will be positively related to perceived crowding. The study will also examine whether personal space preferences are linked to the extent to which the behaviour of others is perceived to be aggressive.

In addition, the extent to which the experience of subjective arousal and stress mediates the relationship between personal space preferences and the experience of being crowded will be assessed. Finally, this study will also examine whether arousal, stress, or psychological well being mediates the relationship between perceived crowding and hostile attributions of an aggressive event.

METHOD

Participants

Seventy-nine prison inmates from a medium to high security prison participated in the study. All participants were volunteers and all were adult male. Inmates ranged in age from 21–35 years, and the mean and modal age was 25 years old. This age range is representative of the prison population as a whole, with 66% of male inmates in the UK falling between the ages of 21–39 [HMSO, 2000]. Data regarding length of time spent in the prison was not measured, as it was a condition of the research that the inmates would not be identified. It was felt that length of stay and age data together could be used to identify individuals. All participants completed the study individually with the researcher. Inmates were recruited from three basic prison wings. All inmates present on the wings at the time of data collection were included for the study, with the following exemption criteria. Inmates did not take part in the study if (i) they were currently under disciplinary action and under solitary confinement, (ii) English was not their first language, and (iii) if they had very low levels of literacy. Whilst this removed some groups from the sample, it was not felt that this compromised the representativeness of the sample to any great extent.

Measures

Personal space preferences. This was measured using an 'imagined' stop-distance technique. Each participant is given a sheet of paper with a cross in the centre, and asked to imagine that the cross represents the inmate standing motionless in an empty room. They are then asked to imagine that a person is walking towards them from each of four directions: towards the participant's face; towards the participant's left side; towards the participant's right side; and towards the participant's back. Participants have to indicate the point at which they would like the person to stop. The standard stop-distance technique is a well-used measure of an individual's personal space [see O'Neal et al., 1979]. Using the imagined test, however, meant that some measure of individual personal space preferences could be gathered in this more restricted data collection environment. The alpha co-efficient for the four items was good $\alpha = .81$, with higher scores indicating a preference for extended personal space. The four items were converted into a composite score by calculating the mean personal space score for each participant.

Subjective Crowding Questionnaire (SCQ). A measure of subjective crowding was developed for the purposes of this study. Items were constructed in order to measure previously identified components of subjective crowding, while maintaining the relevance of questionnaire items for a prison population. These included: available social support [Evans and Lepore, 1993]; access to resources [Epstein, 1982]; amount of privacy [Altman, 1975]; demands upon attention [Baum and Paulus, 1987]; and social withdrawal [Evans et al., 2000]. The measure consisted of 16 statement-items e.g., ''I often feel that privacy is difficult to achieve,'' followed by a Likert-type scale, where 1 indicates strong agreement with the statement, and 7 indicates strong disagreement with the statement. Alpha co-efficients within this study were good ($\alpha = .72$) and the scale was condensed to a composite score by calculating the mean score for each participant across all items. Items were reversed as appropriate to ensure the unidirectional nature of the scales. High scores indicated higher levels of subjective crowding.

Stress-Arousal Checklist [SACL – Mackay et al., 1978]. This scale measures participants' current levels of stress and arousal using an adjective checklist, e.g. energetic (arousal), and uneasy (stress). Participants indicate the extent to which each adjective accurately describes their current state on a four-point scale. Alpha co-efficients were good (stress: $\alpha = .84$; arousal:$\alpha = .78$), with high scores indicating higher levels of both stress and arousal.

General Well-Being Questionnaire [GWBQ – Cox et al., 1983]. Questions ask participants to indicate their levels of well being over the previous six months. Items comprise symptoms related to the experience of tension (e.g. have you been tense or jittery?) and fatigue (e.g. have you got tired easily?). Participants indicate on a five-point scale the extent to which they had experienced each symptom: (4) all the time; (3) often; (2) sometimes; (1) rarely; and (0) never. Alpha co-efficients were good (tension: $\alpha = .79$; fatigue: $\alpha = .81$), and high scores indicated higher levels of tension and fatigue.

Perceptions of Aggression Scale (PAS). A measure of perceived aggression was developed for the purposes of this study. The measure involves participants responding to a written account of a violent incident by completing a 43–item questionnaire. The incident report of an aggressive interchange between two prisoners at a mealtime acts as the stimuli for participants. This scenario was chosen because mealtimes have been highlighted as a potential trigger for aggressive episodes in prison [Lanza et al., 1994] and would therefore be relevant for this sample of participants. Similar materials have been used elsewhere to illustrate differences in perceived aggression [Lawrence and Leather, 2003].

Following the incident report, participants are requested to make a series of judgements about the aggressive event, related to existing literature on aggressive perceptions and attributions. Specifically, 43 statements are presented relating to concepts of protagonists' intent e.g., 'Pete intended to push John into the counter' [Geen, 2001]; protagonists' malevolence, e.g., 'John shoved Pete to teach him a lesson' [Tedeschi and Nesler, 1993]; justification of the behaviour, e.g., 'John was justified in shoving Pete' [Leather and Lawrence, 1995]; foreseeability of harm, e.g., 'Pete knew that John was likely to get hurt' [Tedeschi and Nesler, 1993]; attribution of responsibility, e.g., 'John was to blame for causing the fight' [Shaver, 1970]; and sympathy, e.g., 'I feel sympathetic towards John' [Leather and Lawrence, 1995]. Participants are asked to respond to each statement on a Likert-type scale where 1 indicates strong agreement with the statement and 7 indicates strong disagreement with the statement. Again, the alpha coefficient obtained was good ($\alpha = .89$), so the scale was condensed to a composite score by calculating the mean score for each participant across all items. Items were reversed as appropriate to ensure the unidirectional nature of the scales. High scores indicated greater perception of aggression occurring during the incident.

Procedure

Participants were asked initially, via the prison officers, whether they would agree to take part in the study. All the participants who were asked agreed to take part. Each participant was then taken from his cell to a private room. They were given an information sheet outlining the materials for completion, and they were asked to sign a consent form if they agreed to take part. No participant withdrew consent at any point. The participant was then given a booklet containing the study materials, and all participants were made aware that they could ask questions to the researcher at any point. There was no time restriction and participants worked through the booklet in the following order: (i) imagined stop-distance

task; (ii) subjective crowding scale; (iii) perceived aggression scale; (iv) stress-arousal checklist; and (v) general well-being questionnaire. When the participants had completed the booklet, the purpose of the study was fully explained.

RESULTS

All means, standard deviations (SDs), Range, and alpha coefficients are shown in Table I. Tests for normality were conducted on all variables, and all but two variables were found to be normally distributed in this sample. Uptight scores were slightly positively skewed, and so were subject to a square root transformation, which resulted in normal distribution. Arousal scores were slightly negatively skewed, and so were subjected to reflect and square root transformation, which also resulted in normal distribution [following Tabachnick and Fidell, 1996].

The zero-order correlations are presented in Table 2. Subjective crowding was positively associated with arousal ($r = .34$; $p < .01$), personal space preferences ($r = .43$; $p < .01$), and stress ($r = 45$; $p < .01$). Importantly, there was an association between perceived crowding and perceptions of aggressive behaviour, ($r = .27$; $p < .02$). A power analysis showed that for this sample, all correlations where $r < .28$ indicates a large effect [Cohen, 1988].

Mediation Effects of Stress and Arousal

Two separate sets of regression analyses were therefore performed to test whether arousal and/or stress mediate the relationship between personal space and subjective crowding,

Table I. Descriptive statistics

Variable	Mean	SD	Min	Max
Personal Space	26.43	17.23	2.00	121.50
SCQ	4.59	.93	2.18	6.69
PAS	4.12	.73	2.31	5.65
Stress	1.45	.62	.33	3.39
Arousal	1.58	.62	.33	3.00
Fatigue	1.88	.65	.42	3.42
Tension	1.28	.71	.09	3.09

Table II. Zero-Order Correlations Between Variables

	Perceived Aggression	Arousal	Crowding	Personal Space	Stress	Tension
Arousal	.15					
Crowding	.27*	.34***				
Personal Space	.10	.31**	.43***			
Stress	.02	.29**	.45***	.34**		
Tension	.05	.13	.19	.125	.42***	
Fatigue	.04	.10	.26*	.20	.38***	.77***

***$ps < .001$.
**$ps < .01$.
*$ps < .05$.

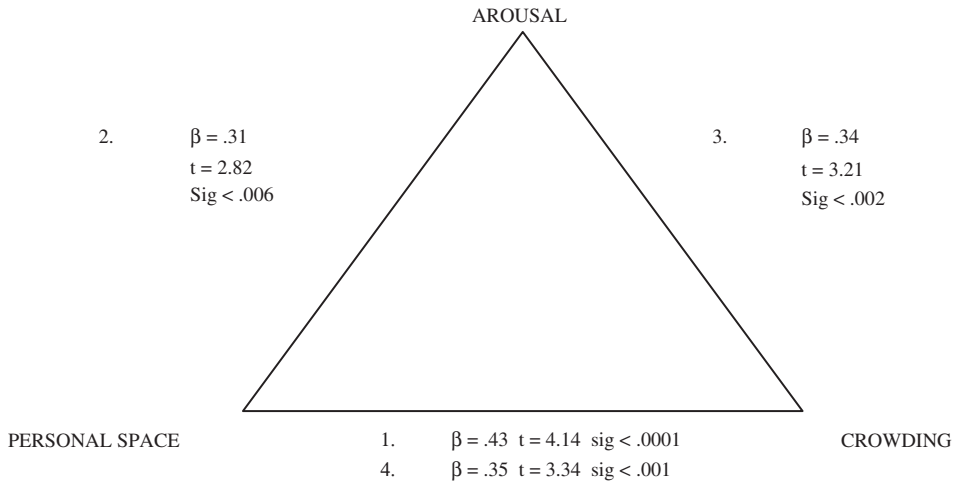
following the procedure outlined by Baron and Kenny [1986]. These analyses will be presented in turn.

Mediating Effect of Arousal on the Relationship Between Personal Space Preferences and Perceived Crowding

Figure 1 illustrates the results of the mediation analysis. It can be seen that there is a partial mediation by arousal in the relationship between personal space preferences and the perception of crowding. The relationship between personal space and crowding, however, still remains significant when arousal is taken into account ($p < .002$), so arousal can only partially explain the relationship. Values of R given in Figure 1 all indicate moderate effect sizes.

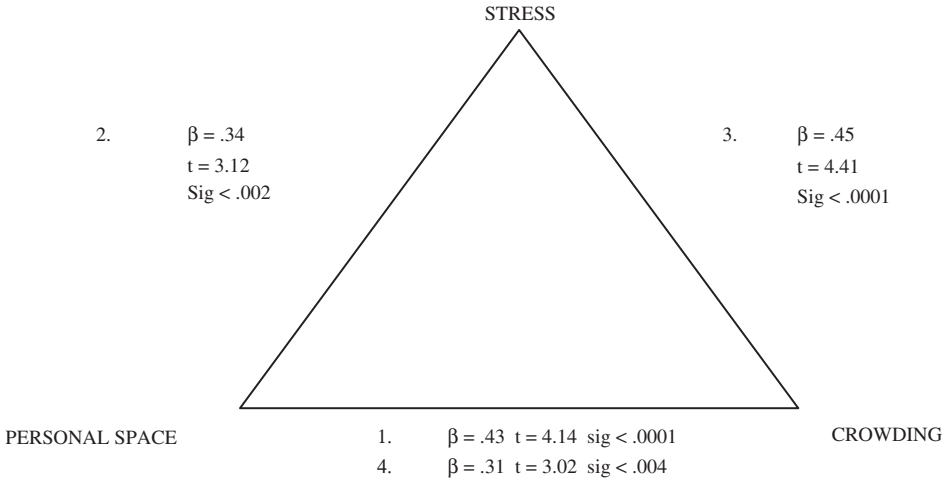
Mediating Effect of Stress on the Relationship Between Personal Space Preferences and Perceived Crowding

Figure 2 illustrates the results of the mediation analysis. Again, there is a partial mediation by stress in the relationship between personal space preferences and the perception of crowding. However, the relationship between personal space and crowding still remains



			95% Confidence for B	
B		Effect size	Lower	Upper
Path 1	.002	$R^2 = .18$	.01	.04
Path 2	.001	$R^{2\cdot} = .1$	.003	.02
Path 3	.58	$R^{2\cdot} = .13$	.23	.93
Path 4	.002	$R^{2\cdot} = .24$	.01	.03

Fig. 1: Diagram showing partial mediation of arousal in the relationship between personal space and perceived crowding.



			95% Confidence for B	
	B	Effect size	Lower	Upper
Path 1	.002	R^2 = .18	.01	.04
Path 2	1.13	$R^{2.}$ = .11	.004	.02
Path 3	.73	$R^{2.}$ = .20	.40	1.06
Path 4	.001	$R^{2.}$ = .28	.03	.006

Fig. 2: Diagram showing partial mediation of stress in the relationship between personal space and perceived crowding

significant when stress is taken into account ($p < .04$), so stress can only explain some of the relationship. Values of R given in Figure 2 all indicate moderate effect sizes.

Secondly, stress and arousal may account for any relationship between crowding and the perception of aggression. As there is no significant correlation between stress or arousal and individuals' scores on the PAS ($r = .02$ and $r = .15$ respectively), however, such a mediating relationship of stress or arousal is not possible. Therefore the relationship between the experience of crowding and the increased perception of an event as aggressive is direct.[1]

Mediating Effects of Fatigue and Tension

It was hypothesised that any link between the perception of crowding and the interpretation of an event as aggressive could be mediated via an individuals' level of psychological well-being (in this case measured as tension and fatigue). However, as neither tension nor fatigue correlated significantly with individuals' perception of aggression, this analysis is redundant. Again, it appears that the relationship between crowding and the perception of aggression is direct.

[1]Indeed, when all other variables are entered into a stepwise regression analysis, the only significant predictor of an individuals' perceptions of an event as aggressive is the extent to which he felt crowded ($\beta = .30$; $t = 2.22$; $p < .03$).

DISCUSSION

The results of this study show that experiences of crowding are associated with the interpretation of an event as aggressive, and the individuals involved in that event as hostile, intentional, and malevolent. In this study, prison inmates were given an incident report detailing an aggressive episode between two inmates. The positive correlation between the perception of crowding and the extent to which the participants believed that the protagonists in the incident were behaving aggressively has not been found before, and may help to account for the relationship between aggressive behaviour and crowding established in prison contexts [Lester, 1991]. As a result, the findings outlined here go some way in supporting a social interactionist explanation for the link between crowding and violence.

In addition, the present study has found some moderate mediation effects for stress and arousal on the relationship between an individual's personal space preferences and his experience of crowding. This would be consistent with findings elsewhere [Worschel and Hunter Brown, 1984]. However, this mediation is only partial, and the main effect appears to be a more direct route between personal space preferences and the experience of crowding, such that those individuals who have a large personal space preference are more likely to experience their environment as crowded. Future work, however, should examine the mediating influence of arousal using physiological markers of arousal and stress, in order to ascertain any changes in the strength of the mediation using alternative and more direct measurements of arousal and stress. It could be argued that this mediating relationship could be reduced further when common method variance is reduced. Alternatively, the mediation could be strengthened due to the use of more direct markers, which rely less on the somatic perception of arousal or stress.

Whilst this study did not find that stress, arousal, or psychological well-being mediated a relationship between crowding and the perception of aggression, it did support other research in illustrating the negative impacts of perceived crowding. Specifically, crowding is associated with increased levels of arousal, stress, and fatigue. However, it may be that aroused and stressed individuals are more likely to experience crowding. In turn, individuals who experience crowding are more likely to interpret events as aggressive.

From an applied perspective, therefore, it appears that by integrating the findings of this study with the existing literature, prison crowding can be linked to violence via two alternative, but potentially integrated, routes. First, this study and previous findings have illustrated the link between subjective crowding and both stress and arousal [e.g., Worschel and Hunter Brown, 1984]. Increases in stress and arousal have also been directly associated with subsequent increases in violent and aggressive behaviour [see Anderson and Bushman, 2002; Knight et al., 2002]. Secondly, in this study, crowding has, for the first time, been associated with more negative and aggressive perceptions of an event. According to social interactionist perspectives of aggression such negative and aggressive perceptions increase the likelihood of aggression being exhibited [Tedeschi and Nesler, 1993]. As a result, crowding is seen as a potent factor in the dual route between prison crowding and violent behaviour.

There are acknowledged limitations of this study. Firstly, the data presented here offer a single event analysis of the effects described. In order to understand fully the impact of crowding in prison on levels of arousal, stress, psychological well-being, and the appraisal of violent events, a longitudinal design would be necessary. In so doing, it would be possible to identify the cumulative impact of crowding over time, and to see how these variables change

over the course of confinement. This would be particularly important for the case of measures of arousal and psychological well-being. For this study, state arousal was measured using the SACL, which gives a good picture of how aroused the inmates were at the time of data collection. Psychological well-being, however, was examined using the General Well Being Questionnaire, which measures symptoms over the previous six months. Secondly, data on inmates' time spent in prison or length of sentence were not available for the present study, therefore it cannot be guaranteed that fluctuations or associations relating to general well-being or arousal were due to factors within the prison environment. Future research with a longitudinal perspective would need to integrate a more transitory measure of psychological well-being in order to disentangle factors influencing shifts in well-being across times of measurement. In addition, future work would need to examine length of sentence and time spent in prison in order to distinguish between short and long-term effects of perceived crowding. Finally, although the sample taking part in this study was relatively small, the effects obtained were moderate. Nevertheless, future replication of the study with a larger sample size would be beneficial, as would a replication involving other crowded populations, for example female prisons, hospital wards, and university halls of residence.

This paper offers a new examination of the way in which crowding and aggression may be linked. Using contemporary theories of interpersonal aggression, this study has investigated the extent to which crowding can act as a priming condition, which increases the readiness with which individuals perceive events as being aggressive and violent. It has shown that male prison inmates who feel crowded also interpret an event as more violent, and the individuals involved as more hostile and aggressive. As research to date has shown that when an individual perceives the actions of others to be aggressive, the likelihood of an aggressive response increases. The role played by perceived crowding is one which warrants further examination.

REFERENCES

Altman I. 1975. The environment and social behaviour: Privacy, personal space, territory, and crowding. Pacific Grove, California: Brooks/Cole.

Anderson K. 2002. Perpetrator or victim? Relationships between intimate partner violence and well-being. J Marriage Fam 64:851–863.

Anderson CA, Bushman BJ. 2002. Human aggression. Ann Rev Psychol 53:27–51.

Baron R, Kenny D. 1986. The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. J Pers Soc Psychol 51:1173–1182.

Baum A, Paulus PB. 1987. Crowding. In: Stokols D, Altman I, editors. Handbook of environmental psychology. New York: Wiley. p 533–570.

Berkowitz L 1993. Pain and aggression: Some findings and implications. Motivation and Emotion 17: 277–293.

Buchanan GM, Seligman MEP. 1995. Explanatory style. Hillsdale, NJ: Lawrence Erlbaum Associates.

Cohen J. 1988. Statistical Power Analysis for the Behavioural Sciences. Hillsdale, New Jersey: Lawrence Erlbaum Associates.

Cox VC, Verne C, Paulus PB, McCain G. 1984. Prison crowding research: The relevance for prison housing standards and a general approach regarding crowding phenomena. Am Psychol 39:1148–1160.

Cox T, Thirlaway M, Gotts G, Cox S. 1983. The nature and assessment of general well-being. J Psychosom Res 27:353–359.

Eastwood L. 1985. Personality, intelligence, and personal space among violent and non-violent delinquents. Pers Individ Dif 6:717–723.

Epstein YM 1982. Crowding stress and human behaviour. In: GW Evans, editor. Environmental stress. Cambridge: Cambridge University Press.

Evans GW, Lepore SJ. 1993. Household crowding and social support: A quasi-experimental analysis. J Pers Soc Psychol 65:308–316.

Evans GW, Rhee E, Forbes C, Allen KM, Lepore SJ. 2000. The meaning and efficacy of social withdrawal as a strategy for coping with chronic residential crowding. J Environ Psychol 20:335–342.

Geen RG. 2001. Human aggression. Buckingham: Open University Press.

Headey B, Wearing A. 1989. Personality, life events, and subjective well-being: Towards a dynamic equilibrium model. J Pers Soc Psychol 57:731–739.

Hildreth AM, Derogatis LR, McCuster K. 1971. Body buffer zone and violence: A reassessment and confirmation. Am J Psychiatry 129:77–81.

HM Chief Inspector of Prisons. 1997. Annual Report 1997–1998 of HM Chief Inspector of Prisons. Home Office: UK. HMSO.

Home Office. 2000. Prison Statistics: England and Wales. Cm5250. UK: HMSO.

Ireland JL. 2000. Bullying among prisoners: A review of research. Aggress Viol Behav 5:201–215.

Knight GP, Guthrie IK, Page MC, Fabes RA. 2002. Emotional arousal and gender differences in aggression: A meta-analysis. Aggress Behav 28:366–393.

Lanza ML, Kayne HL, Hicks C, Milner J. 1994. Environmental characteristics related to patient assault. Issues Ment Health Nurs 15:319–335.

Lawrence C, Leather P. 1999a. Stereotypical processing: The role of environmental information. J Environ Psychol 19:383–395.

Lawrence C, Leather P. 1999b. The social psychology of aggression. In: Leather P, Brady C, Lawrence C, Beale D, Cox T, editors. Work-related violence: assessment and intervention. London: Routledge.

Lawrence C, Leather P. 2003. Perceiving violence: The influence of motivational status and environmental setting. J Appl Soc Psychol 33:1796–1817.

Leather PJ, Lawrence C. 1995. Perceiving pub violence: The symbolic influence of social and environmental factors. Br J Soc Psychol 34:395–407.

Lepore SJ, Evans G, Schneider ML. 1991. Dynamic role of social support in the link between chronic stress and psychological distress. J Pers Soc Psychol 61:899–909.

Lester D. 1991. Overcrowding in prisons and rates of suicide and homicide. Percept Mot Skills 71: 1: 274.

Logan TK, Walker R, Staton M, Leukefeld C. 2001. Substance use and intimate violence among incarcerated males. J Fam Viol 16:93–114.

Mackay C, Cox T. Burrows G, Lazzerini, T. 1978. An inventory for the measurement of self-reported stress and arousal. Br J Soc Clin Psychol 17: 283–284.

McCorkle RC, Miethe TD, Drass KA. 1995. The roots of prison violence-A test of the deprivation management, and not-so-total institution models. Crime Delinq 41:317–331.

Ng B, Kumar S, Ranclaud M, Robinson E. 2001. Ward crowding and incidents of violence on an acute psychiatric inpatient unit. Psychiatr Serv 52: 521–525.

O'Neal EC, Burnout MA, Marquis JF, Carafe M. 1979. Anger and the body-buffer zone. J Soc Psychol 108:135–136.

Paulus PB, McCain G. 1983. Crowding in jails. Basic Appl Soc Psychol 4:89–107.

Perera S, Uddin M, Hayes JA. 1997. Salivary lysozyme: A noninvasive marker for the study of the effects of stress on natural immunity. Int J Behav Med 4: 170–178.

Porporino FJ. 1986. Managing violent individuals in correctional settings. J Interpers Viol 1:213–237.

Shaver KG. 1970. Defensive attribution: Effects of severity and relevance on the responsibility assigned for an accident. J Pers Soc Psychol 14:101–113.

Stott C, Hutchison P, Drury J. 2001. 'Hooligans' abroad? Inter-group dynamics, social identity and participation in collective 'disorder' at the 1998 World Cup Finals. Br J Soc Psychol 40: 359–384.

Tabachnick BG, Fidell LS. 1996. Using Multivariate Statistics (3rd Edition). New York: HarperCollins.

Tedeschi JT, Felson RB. 1995. Violence, aggression, and coercive action. Washington, DC: American Psychological Association.

Tedeschi JT, Nesler MS. 1993 Grievances, development, and reactions. In: Felson RB, Tedeschi JT, editors. Aggression and violence: Social interactionist perspectives. Washington DC: American Psychological Association.

Useem B, Goldstone JA. 2002. Forging social order and its breakdown: Riot and reform in US prisons. Am Sociol Rev 67:499–525.

Wood J, Adler J. 2001. Gang activity in English prisons: The staff perspective. Psychology Crime and Law 7:167–192.

Worchel S, Hunter-Brown E. 1984. The role of plausibility in influencing environmental attributions. J Exp Soc Psychol 20:86–96.