

Effects of Crowding



In humans, overcrowding appears to result in a decline in task performance and deterioration in social behaviour. However, these effects are not universal and may depend on a range of other factors including the amount of **perceived control** the person has over the situation. Additionally, overcrowding may have health effects. Some of these are attributable to the stress that may result from overcrowding; others to the fact that crowded situations can facilitate the spread of disease.

Crowding and Performance

Crowded situations appear to result in poorer performance, but only on more complex types of task. Saegert et al (1975) conducted a study in which participants undertook a number of everyday cognitive tasks including looking up telephone numbers and finding the ticket office. The setting was a railway station and the level of crowding was varied by getting some of the participants to carry out the tasks either mid-morning (low crowding) or during the rush hour (high crowding). Under more crowded conditions, participants were less likely to complete all the tasks and reported higher anxiety and poorer mood. Karlin et al (1978) examined the academic performance of students living in overcrowded conditions (they were living three to a two-person room). Compared to controls, students in the overcrowded accommodation reported higher stress levels and achieved poorer grades. Moreover, once they were relocated to less crowded conditions their results improved. Karlin

et al also found that female students were more adversely affected than males. They suggest that this is because the male students tended to spend more time away from their accommodation, lessening the impact of their overcrowded conditions.

These results support the proposition that crowding is detrimental to cognitive performance. Milgram (1970) suggests that this effect results from **sensory overload**. He argues that environments that are over-rich in stimuli (including high population-density environments) may overload a person's cognitive processes, leading to a decline in performance. However, it does not seem to be the case that crowding inevitably leads to deficits in functioning, as some studies suggest that an individual's perceived control over the environment can act as a mediating factor. Sherrod (1974) used student participants completing various tasks under crowded conditions. Half the students were provided with a button that, if pressed, would result in their being removed from the situation. None of the participants actually used the button, but those to whom it had been provided performed better on the tasks than the controls. It appears that access to the button gave the participants a sense of control that lessened the impact of the crowded environment. Analogous results were obtained by Lundberg (1976). He examined adrenaline levels (a **stress hormone**) amongst commuters on a 72-minute train journey. It was expected that commuters that spent the longest time travelling would have the highest adrenaline levels but this was not the case. The highest levels were found in commuters that joined the train later. Lundberg suggests that those who joined the train at the start had a greater choice over where they would sit that increased their sense of control. Those who joined the train later were forced to sit or stand wherever available, leading to heightened stress levels.

Crowding and Child Development

Apart from the effect of overcrowding on cognitive performance, some research has suggested that crowded conditions can detrimentally affect children's development. Goduka et al (1992) found that crowding was an important predictor of both cognitive development and self-concept in a sample of South African children. Similarly, Widmayer et al (1990) found that overcrowding in the home was associated with poor psychomotor development in Haitian children. Crowding also seems to affect the quality of caregiver-child interaction. Fuller et al (1993) found that crowded conditions were associated with lower levels of verbal stimulation and responsiveness by mothers towards their children. Although overcrowding tends to co-occur with poverty, pollution and other factors that are detrimental to psychological development (which makes it difficult to isolate its precise effects) it seems likely that it is one important factor in producing poorer developmental outcomes (Cassidy, 1997).

Crowding and Social Behaviour

In Calhoun's rat study, overcrowding was associated with increased aggression, particularly in dominant rats. Studies of humans have suggested that social behaviour is adversely affected by higher population density. Altruistic behaviour tends to decline as crowding increases. Latane and Darley (1968) carried out a series of studies that demonstrate this. They were initially prompted by the murder of a woman named Kitty Genovese, who was murdered in a horrific attack, lasting over half an hour, which was witnessed by 38 people who did nothing to intervene – not even call the police. Latane and Darley artificially created analogous situations (e.g. a confederate pretending to have a heart attack in a New York subway station). The results of these studies confirmed that the likelihood of help being given was inversely related to the number of people present. One possible explanation for this phenomenon is **diffusion of responsibility**. Latane and Darley propose that, the more people

that witness an emergency, the less responsibility any particular person will feel for giving help. If only one person is present, then they are the only person that could possibly help and thus bear all the responsibility for doing so. However, if two people are present then each known that the other could help and therefore feels less responsibility for helping themselves. This explanation is supported by interviews with the witnesses to the Genovese murder most of whom appear to have believed that somebody else would call the police.

Other studies have looked at the relationship between population density and more everyday examples of altruistic behaviour. A common way of investigating this area is the 'lost letter' method, in which researchers leave stamped, addressed letters in public locations and wait to find out how many are eventually posted by members of the public. Since picking up the letter and taking it to a post office is a minor inconvenience for which a person will never be recompensed this method is considered a good way of comparing rates of altruism between different areas. Hedge and Yousif (1992) conducted a cross-cultural study using this method. They left letters in large cities and small towns in the UK and Sudan. They found that, in both countries, letters were more likely to be returned in the small town locations (Lichfield and Al-gaily) than in the large cities (Birmingham and Khartoum). Many other studies in which strangers have been asked to help people in various ways (e.g. giving directions, donating to charity, helping an injured passer by) have confirmed this finding, with help more likely to be given in small towns than large cities (e.g. Amato, 1983; Levine et al, 1994).

Some research has linked crowding to antisocial behaviour, but not in a conclusive way. There does not seem to be a relationship between population density in major cities and crime rate. For example, Gifford and Peacock (1979) compared crime rates in Hong Kong and Toronto. Hong Kong has the highest

population density in the world (see above) but has only a quarter of the crime rate of Toronto, which has a much smaller population density. However, aggression does seem to be related to crowding in some settings including psychiatric hospitals and prisons.

Crowding in Prisons

At the time of writing, the newspapers were reporting that the UK prison system was full (*The Guardian*, 13 July 2002) and that prisoners entering the system were being held in police cells. The British prison system is already overstretched, with around 14 000 prisoners sharing cells intended for single occupancy and it appears that the problem is even worse in the US. Research indicates that crowding in prisons is associated with poorer corrective outcomes. Farrington and Nutall (1980) found that prisoners incarcerated in overcrowded institutions were more likely to re-offend on release. Overcrowding in prisons may also be associated with increased prison violence. A number of riots and disturbances in prisons in the UK and US over the past few years have been attributed to overcrowded conditions. Besides this, research has indicated that overcrowding is associated with increased risk of violent death and suicide amongst inmates (McCain et al, 1980) and increased frequency of aggressive acts and disciplinary infractions (Ruback and Carr, 1984). However, not all prisoners respond in the same way to overcrowding. As was discussed above, violent prisoners appear to require larger personal distances than non-violent offenders. Porporino and Dudley (1984) suggest that overcrowding is more likely to be a problem in larger prisons with younger inmates and Anson and Hancock (1992) observe that an offender's prior history of violence is an important factor. Such variations highlight the need for those that plan prison provision to concentrate on the subjective experience of prison crowding as well as on purely objective measures such as population density (Cassidy, 1997).

Crowding and Health

Crowding may have a detrimental effect on health. Studies indicate that crowding is associated with increases in blood pressure (D'atri, 1975; Evans, 1979) and increased secretion of stress hormones (Lundbergh, 1976), in the short term, at least. In the longer term, the picture is not as clear. Fuller et al (1993) identify two reasons why crowded conditions may be detrimental to health: first, the stress associated with crowding may depress the immune system and have other direct health effects; second, overcrowded conditions may facilitate the spread of communicable diseases. A number of studies indicate that crowded conditions (measured in terms on the number of people per household) are associated with increased incidence of colds, asthma, influenza and diarrhoea, particularly in young children (Kearns et al, 1992; Causon-Kaas et al, 1997). Elender et al (1998) studied risk factors for tuberculosis in England and Wales and found that rates were significantly higher in households with more than one person per room. However, the view that crowding *per se* is detrimental to health has been challenged on the basis that people living in overcrowded conditions may be affected by a range of other variables including the presence of damp and mould and poor access to and use of healthcare facilities (Gray, 2001). As is the case with chemical pollution and noise (see chapters 2 and 3) it is practically impossible to separate out the relative contributions of different environmental variables to illness, so whilst it can be shown that ill-health is *associated* with crowded conditions, it is impossible to conclude that crowding is, in itself, detrimental to health (Gray, 2001).

