Seeing green, not red

Contact with nature can reduce violence. **GEOFF LOWE**

CROWDING, high temperatures and noise have all been linked with human aggression and violence. But are there features of our residential environment that work to reduce levels of aggression and violence? One likely feature might be contact with nature – since this appears to ease the sort of mental fatigue that often leads to outbursts of anger.

Frances Kuo and William Sullivan (University of Illinois) investigated the impact of this aspect of the environment on aggression among 145 residents of inner-city urban council housing in Chicago. Their study was a natural experiment on the effects of residential greenery: residents had been randomly assigned to buildings with varying levels of nearby trees and grass, were housed in almost identical residential units in blocks, and a host of environmental variables were held constant. Moreover, the residents were strikingly similar in many of the individual characteristics that might affect aggression – income, education, life circumstances, and perhaps most important, economic opportunities.

Self-reported levels of aggression were relatively high among these residents – 61 per cent reported violence against their partner at least once in their lives (a rate four times that reported in national samples of US couples). Aggression against children showed much the same pattern. But residents in 'greener' buildings reported less aggression and violence than did their counterparts in relatively barren buildings.

Kuo and Sullivan also measured attentional functioning by getting residents to repeat back a series of digits in reverse order – the Digits Span Backwards test. Residents living in greener settings performed better on this attention task. In terms of attention restoration theory, urban environments seem likely to be more attentionally fatiguing and less attentionally restorative than rural environments.

'Attentional demands associated with poverty and inner-city environments are likely to place this population at special risk for chronic mental fatigue and fatigue-related aggression,' says Kuo. 'As a consequence, residents of poor, inner-city neighbourhoods may have a special need for the mental respite provided by nearby nature.'

Many studies have shown that children of violent families are more likely to grow up to be violent themselves, so identifying possible ways of reducing domestic violence might pay benefits for generations to come. 'By reducing intrafamily aggression and thus children's socialization into aggressive and violent behaviours,' says Kuo, 'green neighbourhood spaces may indirectly reduce aggression in future generations.'

Kuo, F. E., & Sullivan, W. C. (2001). Aggression and violence in the inner city: Effects of environment via mental fatigue. *Environment and Behavior, 33,* 543–571.

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As we forgive them

Harbouring a grudge is emotionally and physically bad for you. **NEIL MARTIN**

PSYCHOLOGISTS know that forgiving is better for mental health than is harbouring a grudge. Hostility, anger and blame – the behavioural litany of the aggrieved – have been associated with increased risk of coronary heart disease and even premature death, although no study has directly examined the relationship between forgiveness and physical health.

Research by Charlotte van Oyen Witvliet and her group at Hope College, Michigan, has found that unforgiving thoughts produce greater aversive emotion and higher heart rate, blood pressure and brow muscle activity than do forgiving thoughts.

Over 70 men and women were asked to rehearse hurtful memories and either to bear grudges against the real-life offenders or to imagine granting forgiveness).

Participants felt more negative, aroused, angry, sad and less in control when they imagined being unforgiving. These cognitive and emotional responses were partnered by increased muscle tension at the brow – an index of anxiety.

'Although it is unlikely that the brief unforgiving trials in this study would have a clinically significant effect on health,' the authors admit, 'we believe that the effects…provide a conservative measure of effects that naturally occur during unforgiving responses to real-life offenders.' They suggest that although people cannot undo the wrong done to them in the past, they can change their response to it to protect physical and mental health.

Witvliet, C. V., Ludwig, T. E., & Vander Laan, K. L. (2001). Granting forgiveness or harbouring grudges: Implications for emotion, physiology and health. *Psychological Science, 12,* 117–123.

A long and happy life?

Nuns' autobiographical sketches suggests a link between happiness and longevity. **ANTHONY C. EDWARDS**

POPULAR wisdom has it that positive emotions may be associated with better physical health, such as reduced blood pressure level and better immune functioning. But could a greater predisposition to positive emotional state be associated with life expectancy as well as specific measures of good health? Previous studies using psychometric test scores or optimistic explanatory style as measures of optimism suggest that it could.

Deborah Danner and her colleagues at the University of Kentucky used what may be considered a more ecologically valid measure with a sample of nuns drawn from the School Sisters of Notre Dame in the US. The nuns were participants in a longitudinal study that began in 1930 and involved asking the nuns to write brief sketches of their lives at the time of taking final vows (mean age then was 22). Survival was assessed for the period 1991–2000 and the association between survival and the emotional content of the autobiographical sketches of 180 of the original participants (aged 75 to 95) were analysed. Over this nine-year period 76 had died.

The autobiographical sketches were assessed for number of positive emotion sentences, number of positive emotion words, and range of positive emotions expressed. On all three variables, nuns scoring in the top quartile were found to have a better survival rate than those in the lowest quartile.

One may object that these data only really support an association between longevity and positive emotion for participants in the study who had attained higher ages (75 or more). Aware of this, the authors of the report are currently researching archival material from the longitudinal study to find out whether a positive association between positive emotion and lifespan still exists for those respondents who died prior to 1991 – and are also following the nuns' progress to find out whether this association continues to exist beyond the age of 95.

Danner, D. D., Snowdon, D. A., & Friesen, W. V. (2001). Positive emotions in early life and longevity: Findings from the nun study. *Journal of Personality and Social Psychology, 80*, 804–813.

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How emotion predicts success

A child's knowledge of emotion can predict later academic achievement and social behaviour. **NEIL MARTIN**

THERE is some evidence to show that a child's knowledge of emotions and understanding of emotion predicts later social behaviour and social adaptation (how well the child gets on with other people). Lack of emotional knowledge has been found to correlate with internalising behaviour – feeling anxious about oneself and feeling depressed.

A study by Carroll Izard and colleagues from the University of Delaware investigated whether economically disadvantaged children's knowledge and understanding of emotions could predict academic success and social behaviour later in life. The experimenters reasoned that if economically disadvantaged children were poorer at understanding emotions, this poor understanding would lead to poorer academic success because they would fail to integrate with other children and would be perceived negatively by their teachers (thus leading children to internalise their behaviour further and perform more poorly owing to poor motivation).

The researchers asked 72 five-year-olds to match a facial expression of emotion to a verbal description given by the experimenter and to name facial expressions of emotion – joy, interest, sadness, surprise, anger, disgust, contempt, shame and fear. They found that the ability to recognise and understand emotions was significantly associated with social behaviour and academic success four years later. Even when temperament and verbal ability were taken into account, this behaviour predicted later academic and social success.

The researchers suggest that a lack of knowledge of emotion may affect the relationship between the child and the teacher (and lead to further poor academic performance). It does this by isolating the child from the teacher and reducing exchanges between child and teacher. The teacher's expectation may be lower as a result. The lack of knowledge may also create difficulty for the child in attracting and maintaining relationships with peers, with the negative consequences that this would entail.

Although based on a small sample of children, the authors suggest that the results argue for some form of intervention programmes in schools. Early training in emotional understanding and in facilitating social behaviour may have potentially beneficial consequences for the child later in life.

Izard, C., Fine, S., Schultz, D., Mostow, A., Ackerman, B., & Youngstrom, E. (2001). Emotion knowledge as a predictor of social behaviour and academic competence in children at risk. *Psychological Science, 12*, 18–23.

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Further submission details are on p.503.