

PRESS RELEASE:

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Decline In Face-to-Face Contact Linked to Biological Changes in Humans As Social Networking Increases

A reduction in direct social connections is associated with a growing number of specific physiological alterations and significant health risks, according to a paper published today (19/02/09) in *Biologist*, the journal of the Institute of Biology.

Global alterations in human gene transcription, immune system cytokines and Natural Killer (NK) cells, narrowing of major arteries, incidence of stroke, early death, high blood pressure, dementia, Alzheimer's, and even the common cold, can all be linked to changes in our social patterns. The paper, *Well Connected?: The Biological Implications of 'Social Networking'*, has identified a dramatic decline since 1987 in hours per day of face-to-face social interaction as the use of electronic media dramatically increased (see Fig 1).

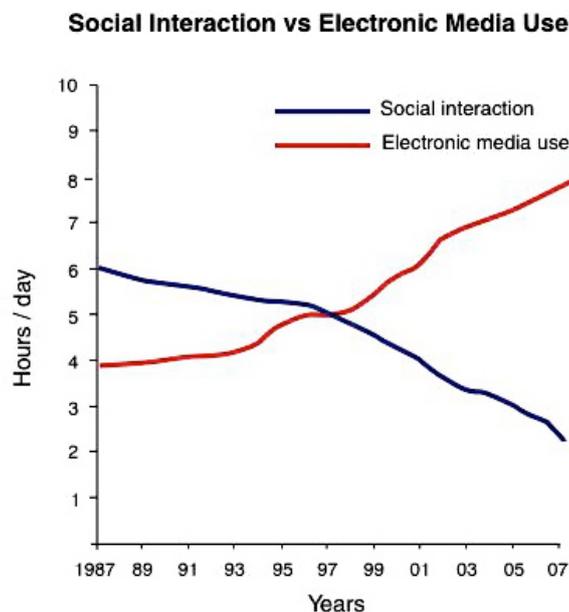


Figure 1. Hours per day of face-to-face social interaction declines as use of electronic media increases. (Sigman A (2009) *Biologist*. 56(1): 14-20)

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“One of the most pronounced changes in the daily habits of British citizens is a reduction in the number of minutes per day that they interact with another human being. In less than two decades, the number of people saying there is no one with whom they discuss important matters nearly tripled,” reports the author Dr Aric Sigman. “Parents spend less time with their children than they did only a decade ago. Britain has the lowest proportion of children in all of Europe who eat with their parents at the table. The proportion of people who work at home alone continues to rise.” The paper collates research carried out across the world on different aspects of the biosciences. By bringing these results together, the impact of social ‘disconnectedness’ in terms of damage to health is now becoming clearer.

Dr Sigman concludes: “Presiding over a growing body of evidence, biologists should now explain the *true* meaning of the term ‘social networking’. At a time of economic recession, our social capital may ultimately prove to be our most valuable asset.”

Notes to editors:

Summary of the findings

“Social connection, both objective and subjective, is increasingly associated with physiological changes known to influence morbidity and mortality,” says Aric Sigman. “However, the intricate mechanisms involved are only now being understood.”

Genetic alterations: Social isolation is actually linked to global alterations in human gene transcription in the small white blood cells (leukocytes) of the human immune system. 209 ‘socially regulated’ genes have been identified, including those involved in immune activation, cell proliferation, Type 1 interferon response, impaired transcription in genes central to mounting anti-inflammatory reaction to illness or stress, increased activity in transcription control that promotes inflammation in disease and stress. This may account for the greater risk of inflammatory disease and adverse health outcomes in people who experience higher levels of subjective social isolation.

Immunological changes: Changes in people’s social contact are linked to alterations in important compounds involved in tumour regression and increased survival times for cancer patients. Natural Killer (NK) cells fight infection, adapt to intruders and are found in immune cells that infiltrate tumours. NK cells are significantly more effective and aggressive in people with more social support. A similar phenomenon is now observed in NKT cells, a rare group of small white blood cells exhibiting anti-tumour activity.

Diameter of arteries: Women with suspected Coronary Artery Disease (CAD) with smaller social circles have been found to have significantly narrower arteries when compared to those with a larger social circle.

Neuroendocrine changes: Everyday aspects of face-to-face interaction, such as touching, hugging and feelings of trust, result in the release of the neuropeptide oxytocin, which has recently been found to prevent detrimental heart function and may explain the relationship between social contact and reduced cardiovascular disease.

Impact on Morbidity (disease):

Stroke: Women with fewer social relationships suffer strokes at more than twice the rate of those with more social relationships and this is a powerful predictor of strokes in women who are at risk. This link rivals that of conventional risk factors.

Blood pressure: loneliness, being in a relationship and number of close friends all influence blood pressure.

Colds: Susceptibility to the common cold decreases in a dose-response manner: people with the most types of social bonds are the least susceptible, while those with one to three types of social relationships are over four times more likely to develop a cold when exposed to the virus than those with six or more types.

Flu: The mere existence of social ties is associated with positive immune response to influenza vaccine, while a small social network is linked with poorer immune response.

Dementia: The frequency of social interaction is inversely related to the incidence of dementia and may protect against dementia and memory loss.

Cognitive function: The amount of regular social contact is positively related to cognitive functioning in a variety of age groups. Only 10 minutes of social interaction is found to improve

cognitive performance equally as well as so-called intellectual activities. Social interaction directly affects memory and mental performance in a positive way.

Impact on Mortality:

Coronary disease: Women who have suspected coronary artery disease (CAD) with a small social circle exhibit more than twice the death rate of those with a larger social circle.

Living alone: People living alone experience a significantly increased mortality compared to people living with somebody, married or not.

Cumulative marriage: In middle-aged men, there is a strong protective effect of marriage that actually occurs in a dose-dependent manner. By simply adding together the periods of time a man was married, the protective effects are seen as cumulative, as are the harmful effects of years being divorced. This cumulative effect is handed down from father to son, continuing to affect the rate of early death in subsequent generations.

Single women: Remaining single has, however, been found to offer one particular health benefit to women. In the United States, the decline in marriage has been cited as the cause for a decline in the murder rate, as fewer husbands now have fewer opportunities to kill fewer wives.

Further Extracts from the Paper:

“For the first time in our history a third of the adults in this country live alone, a trend that looks set to continue and is now highly pronounced in the age group 25 to 44.”

“Britain’s disinclination for togetherness is only equalled by her veneration of communicating through new technologies. This is now the most significant contributing factor to society’s growing physical estrangement. Whether in or out of the home, more people of all ages in the UK are physically and socially disengaged from the people around them because they are wearing earphones, talking or texting on a mobile phone, or using a laptop or Blackberry. Eye and ear contact between people of all ages and relationships is declining,” writes the paper’s author Dr Aric Sigman.

“Time that was previously spent interacting socially is increasingly being displaced by the virtual variety. Children now spend more time in the family home alone in front of TV/computer screens than doing anything else: twenty five per cent of British five-year olds own a computer or laptop of their own. There is an enormous increase in ‘social networking’ among younger and younger children, which is now their main reason for using the Internet. UK social-networking usage is now the highest in Europe. The trend is set to increase.”

“Couples now spend less time in one another’s company and more time at work, commuting, or in the same house but in separate rooms using different electronic media devices.”

“It is clear that this is a growing public health issue for all industrialised countries. Children are now experiencing less social interaction and have fewer social connections during key stages of their physiological, emotional and social development. An increasing proportion of men and women are living alone during their ‘mating years’ having far fewer social contacts. And as the greying of the population continues, the incidence and effects of social isolation are pronounced.”

Dr Aric Sigman is a Member of the Institute of Biology (IOB), Fellow of the Royal Society of Medicine and Associate Fellow of the British Psychological Society. He has travelled to various cultures, including North Korea, Bhutan, Tonga, Myanmar, Iran, Korea, Vietnam, Mali, Bolivia, Burkina Faso, Sumatra, Cambodia and Eastern Siberia to observe the influence of electronic media on social behaviour and health.

Well Connected?: The Biological Implications of 'Social Networking' by Aric Sigman is published in *Biologist*. Volume 56 Number 1, pages 14-20. 19th February 2009.

For an interview with Aric Sigman please contact +44 (0)1273 734019 and email aric@aricsigman.com

For a copy of the paper, please contact Aric Sigman, or Simon Napper, Editor of *Biologist*

Institute of Biology

9 Red Lion Court

London

EC4A 3EF

t: 020 7936 5900

www.iob.org

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