“Open-plan office layout is commonly assumed to facilitate communication and interaction between coworkers, promoting workplace satisfaction and team-work effectiveness. On the other hand, open-plan layouts are widely acknowledged to be more disruptive due to uncontrollable noise and loss of privacy” (Kim and Dear 2013)

There have been many studies evaluating the effect of open plan and enclosed offices on workplace behaviour, productivity and staff impacts. Key aspects of these studies are outlined here.

Creativity and collaboration

It has been found that increased interaction in new buildings occurs principally through sharing infrastructure with other groups rather than the style of workstation (Baumann, 2012). Open plan doesn’t of-itself lead to improved collaboration (Brennan et al., 2002). While the frequency of communication events can increase, their duration decreases (Boutellier, 2008). “Providing open plan environments is not sufficient to produce more collaborative practices in HE [higher education]” (Landsdale 2011). Open plan offices have frequently been found to reduce the confidential or private conversations employee engage in (Davis et al. 2011). This is because “[Informal] interaction is facilitated not by unlimited opportunities for interpersonal contact, but by the opportunity for privacy” (Becker et al. 1983). In another study “the benefits that are often associated with open-plan offices did not appear: cooperation became less pleasant and direct and information flow did not change” (Kaarlela-Tuomaala et al. 2009).

Lack of privacy can stifle creativity. “New ideas in a research environment emerge from an iterative process: both discussions between researchers and deep individual reflection are important for innovative ideas ... a stimulating work environment provides both an area for the employees to be social and spontaneously engage in unplanned meetings and an area where they can retreat, be alone and concentrate” (Baumann, 2012). This is termed the “cave-and-commons designs in offices ... if you take all the caves away, people are distracted and interrupted, and creativity falters” (Thompson, 2013). Having the right degree of privacy at work stations can foster “distraction avoidance and continuous improvement”, to result in staff who are “more productive” (Bernstein 2012).

In summary, “the open-plan office is not recommended for professional workers” (Kaarlela-Tuomaala et al. 2009). “Benefits of enhanced ‘ease of interaction’ are found to be smaller than the penalties of increased noise level and decreased privacy resulting from open-plan office configuration” (Kim and Dear 2013).

“If the job process involves a lot of focused, “heads down” thinking, whether it is a simple task (e.g., simple copy editing) or a complex task (e.g., complex research coding), a more enclosed and private
work space may be beneficial. However, physical barriers are not necessarily an advantage for all types of work. In particular, jobs requiring less cognitive focus but more stimulation -- such as a simple sorting tasks or a complex brainstorming sessions -- may benefit from less privacy and enclosure.” Barriers “may inhibit collaboration in environments that require fast-paced problem solving and decision making and ... reduce performance on simple tasks that benefit from social facilitation effects.” Barriers may also “signal and reinforce undesired status and power differences between workers, especially in organizations that wish to improve collaboration and feedback across job levels and ranks” (Elsbach and Pratt 2005).

**Interruption processes and effects**

Open plan increases both auditory and visual distractions, and reduces job satisfaction, concentration and performance (Elsbach and Pratt 2005; Davis et al. 2011). Speech is a large cause of interruptions in open plan work areas, with neighbours within 10 m causing impact (Kaarlela-Tuomaala 2009). “Exposure to irrelevant speech has been found to impair performance on short-term memory tasks, as well as reading comprehension and proof-reading” (Landsdale et al. 2011).

The less noise (fewer voices) in open plan areas, the less interrupting it is; frequent intermingled voices are more interrupting than isolated voices (Jaancke 2011, Smith-Jackson 2009). Thus, the number of open plan workstations in each group should be kept as small as possible by using dividing walls – enclosed shared spaces rate much better for sound privacy than cubicles with partitions, although still well below private offices (Kim and Dear 2013). Keeping employees whose work requires the most conversations and phone calls out of open plan is another strategy to reduce interruptions.

It has widely been found that open plan has poorer productivity outcomes than closed offices (Kim, 2013; Landsdale 2011; Davis et al 2011). It has been found that noise level “greatly reduces the productivity, which drops to one third relative to what it would be in quiet rooms” (Treasure).

Open plan has a large impact on knowledge workers. “Cognitively demanding work and phone conversations [are] most distracted by noise” (Kaarlela-Tuomaala 2009). “Employees in the high need for concentration group reported more distraction in all office types except in cell offices and also more cognitive stress in all office types except cell offices and flex offices. In conclusion, cell offices may be preferable for tasks that require higher need for concentrations” (Seddigh et al 2014). A survey of “38 000 knowledge workers in predominantly open-plan office space ... found that one of the biggest losses of productive time during the day stemmed from interruptions by colleagues” (Davis et al. 2011).

**Health impacts**

Workers in open-plan offices get sick more often (Codrea-Rado 2013). The poorer health, job satisfaction and performance in open plan don’t improve with time after moving into open plan office environments (Bergström et al., 2013; also found in review by Kim and Dear 2013).

Some people are genuinely more affected by open plan interruptions than others. “Satisfaction and performance [are] reduced for employees with poor stimulus screening or poor inhibitory ability” (Maher and Hippel 2005). There are “reliable divergences between the responses of PhD students ... and older, longer-serving research associates” with the former more comfortable with lower levels
of privacy and greater interruptions (Landsdale et al 2011). Also, older workers are less able to cope with noise (Codrea-Rado 2013). Introverts can be over-whelmed by social stimulation, and require room for focus and privacy (Cain 2014).

“Enclosed private offices clearly outperformed open-plan layouts in most aspects of IEQ [indoor environmental quality], particularly in acoustics, privacy and the proxemics issues” (Kim and Dear 2013). It appears to be more difficult to control temperature adequately in open plan environments.

Irrespective of office type, colon cancer is increased in people who sit for long periods independent of what they do the rest of the day, says a review study covering 4 million people (Scientific American).

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