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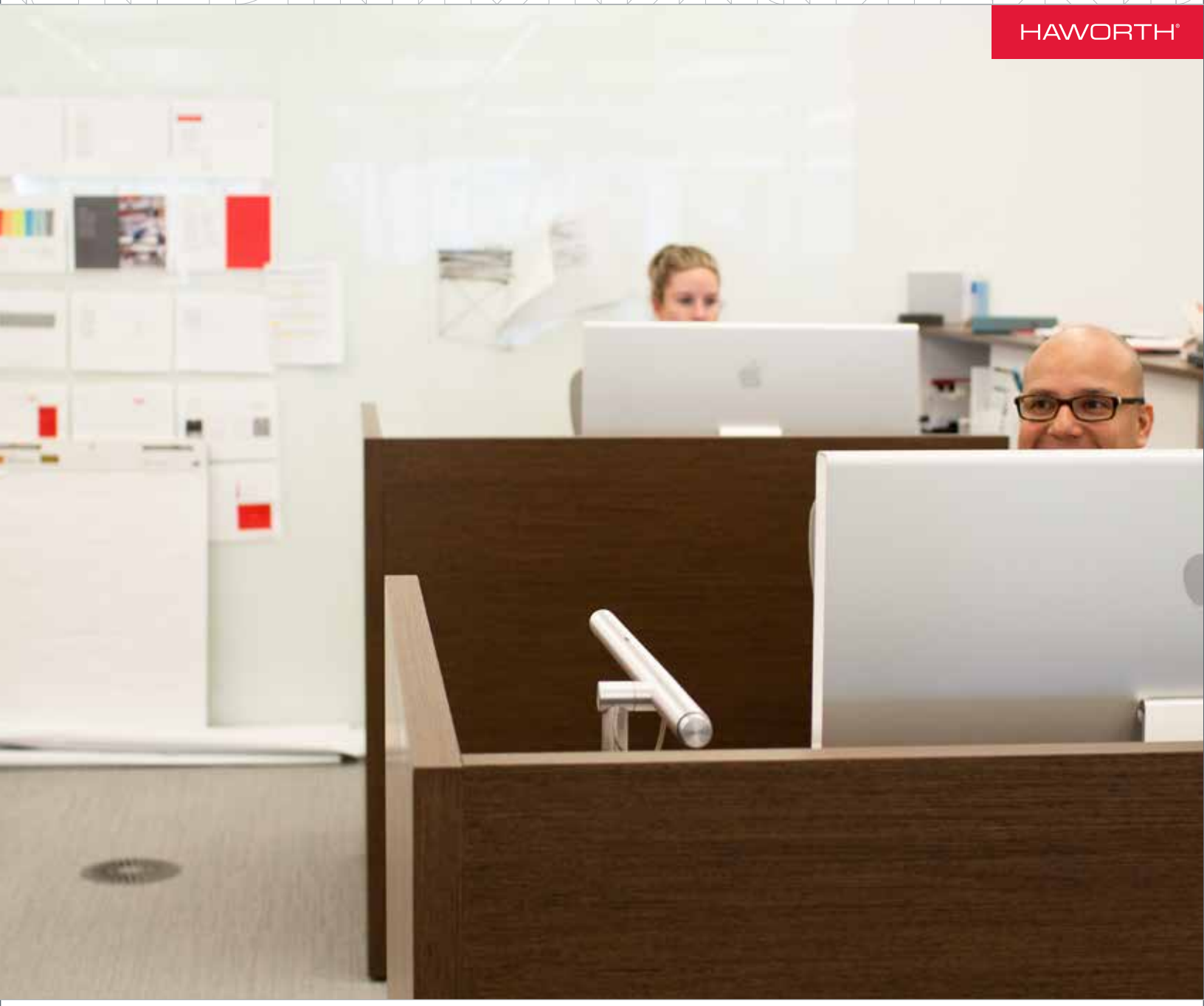


Are Gen-Y's Brains "Modular" or "Unconscious"?

by: Jay L. Brand, Ph.D.

Many people assume that younger workers can process information in fundamentally different ways than their older counterparts. This paper reviews research relevant to that assumption and explores the association between office design and communication styles.

Competing Office Design Visions

Two visions have always competed for the soul of office design. A reduction of overhead (ROO) perspective views office design as a cost-reduction tool, mostly realized by putting more people into less space. In contrast, Bürolandschaft's "office landscape" and others represent a strategic vision for office design (SVO). Largely through the lens of the behavioral and social sciences, this approach views office design as a strategic investment in people—space functions as a business tool by increasing worker effectiveness.

The introduction of pre-wired acoustic panels promised the best of both visions—ROO through increased density—and SVO through increased privacy. Unfortunately, privacy was defined as a product characteristic rather than a dimension of occupant experience.[1] This attempt to integrate two fundamentally competing visions for office design—to have our cake and eat it too—remains with us today.

The Myth of Multitasking

One of the latest manifestations2 of this design non sequitur (that there exist office designs which allow us to reduce costs endlessly while simultaneously improving employee effectiveness) assumes younger generations of workers, beginning either with Gen-X or Gen-Y, process information differently than their older counterparts. Privacy is not needed because these up-and-coming prodigies can ignore distractions within more open office environments. Therefore, businesses can concentrate solely on ROO because the SVO vision can be achieved without the help of office design—it remains neatly ensconced in the advanced cognitive abilities of the young. (For a recent indictment of open plan work environments for all age groups, see Oommen, Knowles & Zhao, 2008).

Unfortunately, careful laboratory experiments have shown this to be largely a myth, in spite of abundant (and compelling) anecdotal evidence (Anderson, 1993; Glass et al., 2000; Laird, Newell & Rosenbloom, 1987; Laughery, 1989; Meyer & Keiras, 1997a; 1997b). Basically, for all age groups, doing two or more things at once hurts primary task performance compared to single-task conditions. Certainly task complexity, experience level, strategy differences (such as dynamic attention requirements across task subcomponents), and other factors can influence this so-called dual-task performance deficit, but it has been shown to be quite robust across situations and conditions — particularly for difficult tasks.

Task sharing or multi-tasking—switching from focused to unfocused tasks and back—takes time. According to research, it takes approximately 15-20 minutes to recover from every interruption.

It's easy to believe that younger workers may differ from their older counterparts in regard to frequency of multi-tasking. They certainly keep track of many gadgets and monitor information from all of them with some level of proficiency (see Tapscott, 2009). But this continuous partial attention, to borrow Linda Stone's phrase, may have some negative side effects, including lower primary task performance, techno-brain burnout, and reduced sensitivity to face-to-face social cues (Small & Vorgan, 2008). Gen Y's brains haven't changed, but their behaviors have.

The Cognition of Distraction

You can learn to ignore meaningless stimuli (such as background noise in a café), but you cannot ignore stimuli in the form of your native language. It is an automatic reaction and, by definition, distracting.

Theorists have been studying distraction and its effects for some time. Many years ago, Paivio proposed the "dual coding hypothesis" to explain evidence that linguistic or verbal cognitive processing differs from imagery-based, nonverbal processing in a number of ways, perhaps even involving different areas of the brain (see Paivio, 2007, for a recent update). What's more, in 1977 Shiffrin & Schneider wrote influential papers demonstrating that to a certain extent, such functional distinctions between cognitive tasks depend on learning. They distinguished between controlled tasks which demanded attention and automatic information processing which did not. These categories reflect William James' classic distinction between voluntary and involuntary attention and, to a certain extent, map onto control of novel or complex tasks and well-learned tasks, respectively.

Is Gen-Y Special?

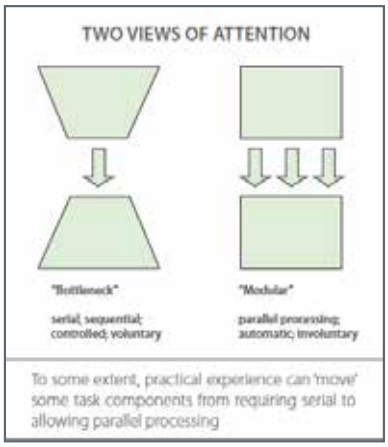
With simple, well-learned, over-rehearsed tasks, perhaps. With complex, unpredictable tasks requiring generative responses to novel, semantic stimuli, probably not.

Why the detour into cognition and attention? This early work presages current interest in whether the brain consists of a collection of independent modules operating in parallel, or if it features a general-purpose executive ruling a hierarchy of operations. If the brain is modular (table left), then presumably it can do many things at once, in parallel, without interference across tasks. However, if it is a general-purpose device, then it can really only do one thing at a time. An additional controversy revolves around the extent to which practice or experience with certain activities can alter brain function from the general-purpose executive model to a collection of modules running in parallel somewhat unconsciously (compare to Kearney, 2007).

Hence the discussion of Gen-Y's presumed enhanced cognitive abilities. Has their greater developmental exposure to a variety of technology (compare to Palfrey & Gasser, 2008) made their brains veritable cities of activity — all operating smoothly and efficiently without interference even between adjacent tasks?

The best answers available now suggest that if we focus primarily on lower-level, unconscious, mental operations, younger people may have learned to divide their attention across several different sources of information (compare with Payne et al., 1994; Schumacher et al., 2001). But for complex, unpredictable, demanding tasks, such as the ones that often confront knowledge workers, their neurocognitive machinery remains subservient to the bottleneck of doing only one thing at a time if high-quality performance is necessary (see Hans Korteling, 1994; Pashler, 1994). Furthermore, distractions interfere with younger workers' performance on complicated, challenging tasks just as they do for older employees.

Younger generations cannot learn to ignore conversations around them any better than their older counterparts. Thus, Gen-Y knowledge workers, at least while working independently, need approximately the same physical design conditions as older employees do if they are to excel at their work.



Some theories of attention hold that engaging in a complex task creates a processing bottleneck that prevents anything else from being done at the same time. In contrast, other theories accept that doing more than one even complex task at a time is possible.

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Office Design Challenges

The world of work, currently involving three generations, may be shifting from primarily individual to more collaborative activities. Younger office workers spend a greater proportion of their time working in groups or teams than older employees. This trend increases in more open work environments and for younger employees (Brand, 2008). See figures below.

Given this long-term trend toward greater collaboration, should office environments be designed differently to accommodate this shift? Although designers must answer that question in practice, it's still largely undecided. Related questions include whether employees' identities can shift from being associated with a personal territory and dedicated individual space to being associated with group and team territories, and whether collaborative zones can be integrated within individual work areas.

At the very least, the advantages of private offices for concentrative, individual work should be acknowledged. That way, these benefits can be provided through a variety of work area types differing in size, formality, and privacy levels. This allows all age groups to self-select the most appropriate environment for various tasks. If possible, group and individual work activities should be acoustically separated—neither contributes anything to the other. Finally, sacrificing some support for individual work to accommodate more collaboration may harbor disadvantages as well as advantages. More work to do!

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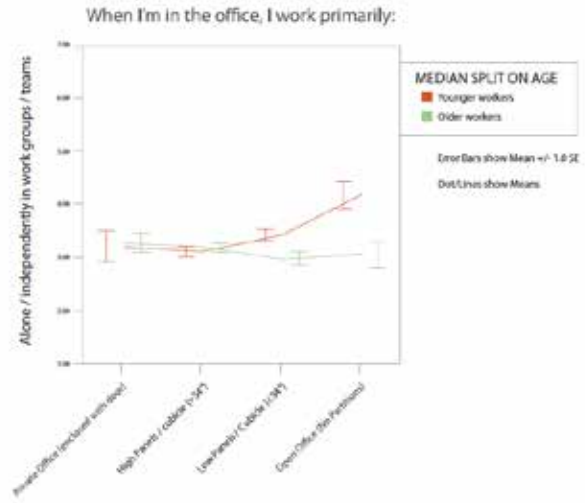
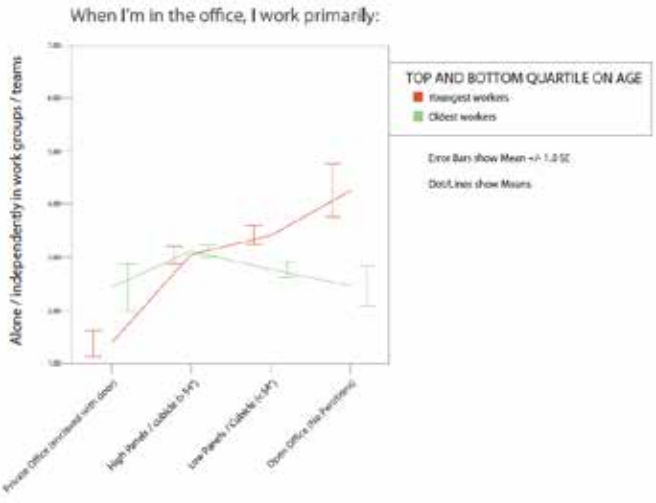
AGE AND COLLABORATION WORK TRENDS IN NORTH AMERICA



Age difference (median split) in collaborative work as a function of office enclosure; this trend does not depend on job level, job role, or gender.



Age difference (quartile split) in collaborative work as a function of enclosure. Note the increased difference relative to the median split, suggesting a continuing, cross-generational trend.

[1]Speech privacy can be defined as the inverse of speech intelligibility. Up to 80% redundant, speech is well-learned and processed to the level of semantics and meaning automatically; thus, neither younger nor older employees can "learn" to ignore speech around them. The physical conditions that provide speech privacy to an arbitrary level within open offices are well-known (Orfield & Brand, 2004), and include absorptive ceilings, sound masking, absorptive floors; absorptive, low-transmitting walls or panels; and low occupant densities. It is meaningless to determine which of these factors contributes the most to privacy, because if they're not jointly present, speech privacy is not achieved due to redundancy levels in the stimulus.

[2]Others include access to daylight, adequacy of change management to help people adjust to more open office environments, and increased communication (i.e., support for collaboration). Typical attempts to integrate ROO and SVO visions for office design argue that the necessity of daylight and support for communication require more open office environments (and therefore less privacy). However, if knowledge worker productivity is the goal, there is no substitute for providing speech privacy through the physical design of the office. Nonetheless, Haworth's Ideation Group has collected international evidence that suggests knowledge work is shifting from primarily individual activities to more group-based tasks. Assuming continued confirmation of this trend, the central focus for office design to support knowledge work may need to accommodate support for collaboration at some expense to the effectiveness of individual work. In most cases, however, design decisions related to these issues rely more on intuition and anecdote than scientific evidence (see Brand, 2008, for a review of recent literature).

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