Face facts: People don't stand out in crowds

January 18 2008

Why is it difficult to pick out even a familiar face in a crowd? We all experience this, but the phenomenon has been poorly understood until now. The results of a recent study may have implications for individuals with face-recognition disorders and visual-attention related ailments — and eventually could help scientists develop an artificial visual system that approaches the sophistication of human visual perception.

The study is part of the recently completed *Journal of Vision* special issue titled “Crowding: Including illusory conjunctions, surround suppression, and attention” (www.journalofvision.org/7/2). “Crowding” is a failure to recognize an individual object in a cluttered environment. It may be due to one of the shortcuts our brains use to help us make sense of the vast amount of visual information we take in every second.

This special issue contains 25 articles devoted exclusively to crowding and related topics. Other noteworthy studies include “Effect of letter spacing on visual span and reading speed” which links reading speed to the number of letters we can recognize without moving our eyes. The impact of contrast and character size on reading speed is examined in “The case for the visual span as a sensory bottleneck in reading.”

The authors conducted five experiments to measure participants’ recognition of a familiar face or house that was located in a crowded display of other faces or houses. They found that face recognition is more difficult when target faces are surrounded by upright faces (as seen in crowds). This effect was not present for images of houses, or when upside-down faces were used as targets. The results indicate that

searching for a face in a crowd is difficult in part because images of upright faces interfere with each other.

This kind of crowding is well documented in simple features, such as slanted lines or edges. But faces are a complex stimulus. Many researchers believe the importance of faces in our lives lend them special status in the brain: they are processed not as a collection of these lines and edges, as many objects are, but holistically, as a single image. The authors in this study were the first to show that crowding also occurs for these high-level stimuli.

“Crowding may reveal one of the fundamental mechanisms the visual system uses to consolidate or filter a great deal of information into a very few meaningful chunks,” explained Dr. Whitney. “If vision scientists and engineers are to develop an efficient and realistic artificial visual system, they will almost certainly benefit from using the human visual system as a model. An understanding of the visual system’s heuristics, shortcuts and limitations — such as crowding — will likely prove essential in designing effective artificial vision.”

Source: Association for Research in Vision and Ophthalmology