

## **Media Multitasking: The Role of Experience and Practice**

Media multitasking amongst children and adolescents is common. A recent Kaiser Family Foundation study found that about 81% of 2<sup>nd</sup>-12<sup>th</sup> grade children report using multiple media simultaneously. Indeed, for many activities (e.g., instant messaging, using the web, sending email) individuals are almost always also attending to some other medium simultaneously (most frequently, watching television). Corresponding to the prevalence of media multitasking in children (and adults), there is growing interest in the scientific community about the implications of this type of multitasking.

As a cognitive and educational psychologist, much of my research has focused on the nature of executive functions. Executive functions are the mechanisms responsible for the control and regulation the cognitive system. These processes include the ability to inhibit irrelevant information and inappropriate actions, initiate relevant actions, and manage and update goals, and select what information is available in the focus of attention. Media multitasking is highly demanding of these executive processes, because it inherently requires individuals to switch from one task to another, ignore distractions, and so forth.

One goal of the research in my laboratory has been to examine the degree to which executive functions can be improved with practice. In one line of research, I have focused on training of task-switching ability. Task-switching is the ability to rapidly shift between two tasks. It has long been known that there is a cost associated with task-switching (Jersild, 1927). It has been argued that this cost is associated with the . We have found that practice on a variety of switching tasks leads to generalizable improvement in task-switching (Minear & Shah, 2008). Specifically, we have argued that improvement in task-switching arises from a reduction in the ability to recover from unexpected switches (Minear & Shah, 2008). In other studies we have found successful improvement in task switching performance in older adults (Minear, Shah, & Park, 2002) and ADHD adults (White & Shah, 2006).

With respect to media multitasking, these results are somewhat encouraging. Individuals who regularly multitask may actually be less impaired in multitasking performance than individuals with less practice. It is important to note, however, that in our studies multitasking costs are not eliminated and that there is always some reduction in performance in a task-switching context. Furthermore, multitasking may lead to cognitive fatigue and impaired performance on later cognitive activities (e.g., Perrson et al., 2007). Nonetheless, much recent research has suggested that executive functions and working memory processes may actually be improved with practice (Jaeggi et al., 2008; Klingberg et al., 2002; Persson et al., 2007). Furthermore, video game playing, in particular, has been implicated as a source of improvement in some attention and executive processes (e.g., Green & Bavelier, 2003; Subrahmanyam & Greenfield, 1996). Future research that examines the effect of media multitasking practice on reduction in impairments may be helpful in furthering our understanding of the potential impact of media multitasking in children with substantial experience.

Another question of interest may be individual differences in the effect of media multitasking. Many studies have demonstrated rather vast individual differences in

multitasking skills. Furthermore, we have found that there are cross-cultural differences in multitasking (Lan et al., in preparation), which may be attributable to different types of experience. Others have found multitasking benefits for bilingual individuals (e.g., Bialystok & Martin, 2004). Based on these studies, it is likely that some individuals may be less impaired by media multitasking than other individuals.

In addition to individual differences and effects of practice, one question of interest is the degree to which intense, cognitively demanding multitasking is actually taking place. It may be that individuals are often combining two non-intense activities, one of which is truly automatic or in the background. Watching television, for example, may serve as “white noise” with attention to the television only occasionally. It may be possible to teach individuals comprehension monitoring and self-regulation skills that help them decide when media multitasking is more or less harmful.

In sum, media multitasking is a reality. However, individuals may learn to adapt to media multitasking, they may actually improve in multitasking more generally from their experiences multitasking, and they may be able to learn to make wiser decisions about when to multitask. Many other questions, surely, remain and I look forward to our discussions.