Why men (yes, men) are better multitaskers

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We should all be forgiven for believing that women are good at multitasking, and far superior to men. After all, that's the popular image that has been in circulation for some time. In this depiction, a vibrant 30-something woman, still in her business suit after a demanding day at the office, is cooking a gourmet meal, balancing a toddler on her hip, all while talking on the phone, presumably raising money for a local charity. Popular books, like *Why Men Can Only Do One Thing at a Time and Women Never Stop Talking*, reinforce the idea that men are incapable of matching women's cognitive balancing act.

The problem with this popular image is that there is not a shred of evidence to back it up. It may be true that working mothers must try to juggle a lot more than men do day-to-day, but there is no proof that they do it successfully. Indeed, nobody has rigorously examined the real question, which is: How skilled are we—men and women—at carrying out several mental tasks at once, without making a lot of mistakes?

Psychological scientist Timo Mantyla of Stockholm University decided to ask just that question in a couple laboratory experiments. Mantyla wanted to explore the idea that multitasking really comes down to two basic cognitive functions: One, the ability to remember and update goals, often called executive function. And two, the ability to reason spatially. Mantyla suspected that individual differences in these two skills alone would predict the most successful multitasking.

Why spatial reasoning? The importance of executive functioning seems apparent, but what does thinking about objects in space have to do with juggling cooking and a phone conversation? Well, think about timelines. Most goal-directed tasks—even something as simple as following a recipe for lasagna—involve thinking about time and steps and deadlines, and a common strategy for handling these complexities is to think about "time in space"—that is, a mental timeline.

Men are known to be better than women at many spatial tasks. So Mantyla hypothesized that individual differences in spatial ability—but not in executive functioning—would explain any gender differences in multitasking. That is, he proposed the heretical idea that men—not women—are superior at multitasking, as a direct result of superior spatial ability.

To test this, Mantyla recruited a group of volunteers, equally men and women, from 19- to 40-years-old, to complete a computerized multitasking challenge. They were required to monitor three digital counters, following these rules: Press the bar when the last two digits of counter number one read 11, 22, 33 and so forth. Press the bar when the last two digits of counter two show 20, 40, 60, and so forth. And press the bar when the last two digits of counter three read 25, 50, 75, and so forth. The counters were not visible all the time. The volunteers had to push a button whenever they wanted to monitor one of the three.

This is sort of like cooking a moderately complex meal—chopping and combining and simmering ingredients at different, precise times. No single task is hard, but coordination can be tricky. To make it

even more like real life, Mantyla had the volunteers simultaneously perform what's called a "name-back task": They watched a long series of common names appear on the screen, one at a time for two seconds each, and they had to hit a bar when the one on the screen matched the one presented four names earlier. Think of this as trying to help a third grader with her homework while chopping and mixing and simmering dinner. The component tasks all put demands on working memory and attention.

Mantyla also gave all the volunteers a standard test of a particular kind of executive control. The idea was to see if individual differences in this cognitive ability predicted multitasking success. And they did. Those who were high on executive control were better multitaskers, making fewer errors overall. What's more, male volunteers outperformed female volunteers on multitasking, making significantly fewer mistakes on the counter tasks. To keep with the analogy, they were about 10 percent less likely to burn dinner while helping with homework.

These results suggest that individual differences in executive control play an important part in complex task coordination. But the results do not fully explain the men's edge in multitasking, since men and women were essentially equal in executive control ability. Something else must be at work, and contributing to men's greater accuracy in multitasking.

That's where spatial ability comes in. In a second experiment, Mantyla directly tested his timeline hypothesis. This time around, in addition to a test of executive control, the volunteers took a mental rotation test, to assess their spatial reasoning ability. Then they all once again completed the multitasking challenge.

Mantyla added one additional twist, asking all the women in the study to record where they were in their menstrual cycle. Men are in general superior to women in spatial ability, but women also vary individually throughout their cycles—with gender differences the greatest during the luteal phase and almost insignificant the menstrual phase. Adding this information created another test of the timeline hypothesis.

The results, to be reported in a future issue of the journal *Psychological Science*, were clear. Once again, men were better than women at multitasking. Men were also much better at the mental rotation task; in fact, this cognitive gender difference fully explained the male superiority in multitasking. Individual differences in spatial ability contributed to multitasking performance regardless of gender, and in fact individual differences in both spatial ability and multitasking fluctuated through the women's menstrual cycle. That is, men were far superior multitaskers when women were in their luteal phase—but this gender difference pretty much disappeared when women entered their menstrual phase.

So it's complicated. But certainly these findings should undermine the widely held popular notion of women as skilled—and superior—multitaskers. Perhaps the most important lesson here is to remain skeptical of the popular wisdom until it's put to a rigorous test.

Wray Herbert's book, *On Second Thought, is about irrational decision making. Excerpts from his two blogs—"We're Only Human" and "Full Frontal Psychology"—appear regularly in Scientific American Mind* and *The Huffington Post.*