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## Texting may rewire young brains

By Adriana Barton

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### *Sending text messages trains young people to be speedy yet sloppy, say researchers*

Texting is not only a nuisance for teachers struggling to keep their students' attention - it's a brain-altering habit, according to a new study.

Researchers say text messaging trains young people to be speedy yet sloppy. The culprit, they suggest, is mobile-phone technology that figures out the word a user wants to type after just a few keystrokes, a system called predictive text messaging. It's easy on the thumbs, but notoriously inaccurate. With frequent use, scientists say, texting may rewire a child's developing brain to be more careless.

Young people who are heavy cellphone users make more mistakes in tasks involving memory, attention span and learning, according to Michael Abramson, an epidemiologist who carried out the publicly funded research.

"We suspect it's a learned pattern of behaviour," he says.

In one of the first studies of its kind, Dr. Abramson and colleagues compared the cellphone use of 317 children aged 11 to 14 with their scores in a battery of tests taken on computers.

You have a brain that's open and still changing, and you have a technology that's demanding that you get faster and more automatic. The natural consequence is that it increases your likelihood of making errors. Laura-Ann Petitto, a cognitive neuroscientist at the University of Toronto

The children who used mobile phones a lot were faster on the tests, but significantly less accurate, says Dr. Abramson, a professor at Monash University in Melbourne, Australia.

Their scores are "evidence of impulsivity," he says.

The study did not include children with ADHD or learning disabilities. A quarter of the children made more than 15 cellphone calls a week and a quarter of them sent more than 20 text messages a week.

Researchers ruled out cellphone radiation as the cause of the brain effects. Dr. Abramson notes that radiation transmitted in texting is just 0.03 per cent of that emitted during a phone call.

Although texting was slow to take off in North America, recently it has overtaken the number of calls made on cellphones. According to a 2008 Nielsen Mobile survey, an American mobile subscriber sends an average of 357 text messages each month - a 450-per-cent increase since 2006.

Children may be especially susceptible to the brain-altering effects of cellphones, according to Laura-Ann Petitto, a cognitive neuroscientist at the University of Toronto.

Their reliance on the gadgets happens at a crucial stage in brain development, she explains.

"You have a brain that's open and still changing, and you have a technology that's demanding that you get faster and more automatic," she says. "The natural consequence is that it increases your likelihood of making errors."

Whether a specific device can affect how the brain functions in unrelated activities remains uncertain, Dr. Petitto says. But, she adds, "it's not a stretch."

Studies have shown that certain technologies, such as video games, can actually enhance various cognitive functions, Dr. Petitto says.

When it comes to texting, however, the jury is still out.

Researchers at England's Coventry University who studied adolescents found a positive link between skilled texting and proper spelling.

Predictive texting goes hand in hand with good language skills, they surmised. If the desired word doesn't appear because of bad spelling, the texter must retype until the cellphone finds the right word, which forces the user to learn proper spelling quickly.

But other studies have blamed predictive texting for creating a generation of lazy spellers who are stumped by everyday words such as "existence" and "occurrence."

Youth are so tolerant of errors in texting that common mistakes - which occur because many words share the same keys - have become part of the lexicon.

In some circles, for instance, the word "jazz" means "lame" because both words are texted starting with 5-2, and "jazz" is the first word many cellphone programs predict.

Texting is troubling because it taps into a domain of the brain that is central to the human species - language, Dr. Petitto says. "While text is visual, it's also parasitic on language."

In the Australian study, however, few of the tests involved literacy or language. In the eyes of some observers, this makes the frequent cellphone users' poor performance even more alarming.

For the brain to develop cognitive skills such as speed or accuracy, it's a case of "use it or lose it," experts say.

When people spend a lot of time on repeated mental activities, such as crossword puzzles or texting, specific neural circuits will grow, according to Gary Small, a neuroscientist and author of *iBrain: Surviving the Technological Alteration of the Modern Mind*.

"But if you neglect other mental tasks, the neural circuits or wires that control them will weaken," he says.

Luckily, the adolescent brain is highly resilient, according to Dr. Patitto. Dealing with a teen's chronic texting is another matter, though.

"You could reverse the [brain] effects of frequent texting," Dr. Patitto says, "but you have to first get the kid off of the cellphone."

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