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Thinking in 140 Characters: The Internet, Neuroplasticity, and Intelligence Analysis

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Abstract

This article argues the neuroplastic effects of contemporary internet use will have critical implications for the U.S. Intelligence Community. Studies have shown the internet and related technologies are fundamentally changing the way people engage information, which in turn has compromised cognitive functioning in a number of important ways. In the analytic segments of intelligence organizations, this phenomenon speaks directly to a—if not the—core occupational function: focused, disciplined thinking. This issue can be expected to be more pronounced among younger and newer analytic cohorts, though it certainly is not an issue reserved for these cohorts alone. While the internet has brought many advances and advantages to the U.S. Intelligence Community, it is incumbent upon intelligence managers to stay aware of emerging threats to analytic process and outputs. In this article, the basic concepts and science of neuroplasticity are introduced, as well as specific findings pertaining to the neuroplastic effects of internet usage. Potential implications for U.S. intelligence organizations are then explored. The article concludes with suggestions for mitigation and future research.

Introduction

Nicholas Carr's recent book, *The Shallows: What the Internet is Doing to Our Brains*, embeds its core message in an impressive historical and empirical review of "intellectual technologies" and advancing knowledge on how the human brain works.[1] That message is the plastic (or changeable) nature of human brain structure and function is proving highly susceptible to the pervasive use of the internet, a relatively new intellectual technology. These changes fundamentally diminish capacity for such things as sustained concentration, deep thinking, and creativity. With the internet, thinking time is increasingly fragmented and frenetic. This changes our relationship with information and the written word. Both the time spent reading and its attendant cognitive benefits diminish, and the brain adjusts its modes of thinking to new (online) habits.

The Shallows triggered the authors to ask what the specific implications of Carr's (and others') observations might be for intelligence analysis, an occupation built around cognitive processes. While there are some fixed, ever present threats to sound intelligence analysis,[2] it stands to reason that as various environmental factors (like technology) change, the context and mechanics of intelligence analysis change as well. Just as intelligence planners and managers predict and prepare for future intelligence needs,[3] the detection and mitigation of emergent threats to the analytic process also needs to be a high priority. This sort of environmental scanning must target—among other domains—neuroplasticity research and technology, which will continue to speak to issues of immediate importance to intelligence analysis. While the authors of this article are not from the neuroscience world, we do feel comfortable bringing some of the general findings from that field into our own. This cross-fertilization is a necessary function for the intelligence literature, and this article is meant only to introduce the issue and explore its potential implications for the practice of intelligence analysis.

This article first introduces neuroplasticity and the specific neuroplastic effects that follow from increased reliance on the internet and related technologies. The qualities of the internet, and the ways in which those qualities interact with and affect cognition, are considered. The following section looks at the potential threats these dynamics pose for contemporary U.S. intelligence organizations, as well as the benefits the internet era brings to the work of intelligence analysts. The article also suggests tentative options to help intelligence organizations mitigate the "shallowing" effects of living in an e-society. It concludes with some directions for future research. It is the authors' hope this article helps prompt serious consideration of those efforts by scientific experts in partnership with intelligence organizations

[1] Carr, Nicholas, *The Shallows: What the Internet is Doing to Our Brains* (New York : W.W. Norton, 2010), 44, which contains a further discussion of intellectual technologies.
[2] Heuer, Jr., Richards J., *The Psychology of Intelligence Analysis* (Washington, D.C.: Center for Studies in Intelligence, 1999); Betts, Richard K., *Enemies of Intelligence: Knowledge and Power in American National Security* (New York: Columbia University Press, 2009).
[3] Stephen Marrin, "Intelligence Analysis Theory: Explaining and Predicting Analytic Responsibilities," *Intelligence and National Security* 22:6 (December 2007): 821-846.

The Concept and Science of Neuroplasticity

While evidence had been mounting for decades, it was not until quite recently neuroscientists concluded the human brain can—at a cellular, physiological level—continue changing well beyond childhood years.[4] Study after study, first looking at brain dynamics in animals and then humans, has confirmed the plasticity not only of adult brain function, but brain composition as well. Simply, consistent use of the brain in particular ways strengthens the neurological pathways and modes of thought conducive to those activities. Likewise, one literally builds up the sections of the brain associated with those activities. Hebb's Rule explains in short order the dynamic behind neuroplasticity: "brain cells that fire together, wire together."[5] Cells that do not fire together do not wire together. This is true in ways that can both benefit and hurt us. The worst manifestations can exacerbate severe mental afflictions. Conversely, neuroplasticity can be used to develop new skills and literally expand our minds. The brain is not biased in its plasticity, but simply responds and reshapes in accordance with the ways it is used.[6] This gives us reason to be concerned, but also optimistic.

One particularly influential set of neuroplasticity experiments began more than 40 years ago under Michael Merzenich. Like a number of early plasticity studies, they examined the brain's response to injury. Merzenich examined how the brains of monkeys responded to the severing of nerves located in the hand. The studies found that after a few months the subject monkeys underwent a reorganization of neural pathways which allowed the hand to again communicate with the brain and regain normal functionality. This was the first broad recognition in neuroscience community that brains are in fact plastic.[7]

Others built on Merzenich's research using human subjects, first with injury research and then with experiments testing the neuroplastic effects of repeated physical and mental activities. Edward Taub of the University of Alabama devised a therapy that helped stroke victims recapture functionality by training new parts of the brain to take on the work of the damaged portions.[8] Taub also conducted an experiment comparing the neural dynamics of violinists to that of non-violinists, finding drastically larger sensory cortexes in the violin playing group. A study of cab drivers in London found unusually large posterior hippocampi, a part of the brain involved in spatial and physical understandings, compared to control subjects.[9]

The Neuroplastic Effects of the Internet and Related Applications

The internet is an intellectual technology, a tool that enhances or extends mental capabilities, that has subsumed or disrupted other media while also creating space for a host of new services and activities for users. Looking back even just a decade or two, the internet has reshaped how

[4] Carr, *The Shallows*.
[5] Ibid, 27.
[6] Doidge, Norman, *The Brain that Changes Itself: Stories of Personal Triumph from the Frontiers of Brain Science* (New York: Penguin, 2007); Schwartz, Jeffrey M. and Sharon Begley, *The Mind and The Brain: Neuroplasticity and the Power of Mental Force* (New York: Harper Perennial, 2003).
[7] Carr, *The Shallows.*
[8] Doidge, *The Brain that Changes Itself.*
[9] Eleanor A. Maquire, David G. Gadian, Ingrid S. Johnsrude, Catriona D. Good, John Ashburner, Richard S.J. Frackowiak, and Christopher D. Frith, "Navigation-Related Structural Change in the Hippocampi of Taxi Drivers," *Proceedings of the National Academy of Sciences of the USA* 97:8 (April 2000): 4398-4403.

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individuals access and use information on a daily basis. A growing number of newspapers, magazines, and even scholarly journals have abandoned hard copy print for online editions only. More and more, people are also relying on the internet and electronic devices to read books. Reading books on a device that is linked to the internet gives us the constant chance to look somewhere else or do something else. And if, really when, a lot of books adopt more internet-like characteristics, such as pervasive hyperlinks and social connections, they will mimic and become an extension of the internet (news articles are already replete with hyperlinks and social applications).

People do a whole host of things online, not just reading. Moreover, our connection to the internet has transcended personal computers. We are now continually plugged in through smartphones and other electronic devices. For many, especially in younger generations, this immersion in all things internet is simply a norm. We want to be in the know and in the now, and the time we spend accessing the internet reflects that.[10] In addition to news gathering and other reading, we are continually checking email, blogging and looking at blogs, using Twitter, signing on to Facebook, pinning on Pinterest, and keeping friends visually updated on Instagram. Social media has moved much of our life online—in our phones, in our computers, and in our minds.

In recent years, researchers have begun examining the neuroplastic effects of increased use of the internet and other cyber technologies. They have found the changes the internet introduces go beyond the habitual and the cultural. It does not take long for the brain to show signs of physiological change after even moderate engagement with the internet and its applications. Gary Small, a psychiatry professor at UCLA, and neuroscientist Gigi Vorgan have found the daily use of cyber technologies "stimulates brain cell alteration and neurotransmitter release, gradually strengthening new neural pathways in our brains while weakening old ones."[11] In tests Small and others conducted, it was demonstrated that even short periods of exposure to the internet activated new neural pathways in the brains of people who had until that point not been regular internet users. In just five days, using the internet for just one hour each day, the non-internet users' activity in the prefrontal cortex had become heightened, mirroring the brain activity of a test group of internet savvy individuals.[12] These findings are not inherently good or bad per se, but demonstrate how plastic the human brain is in the face of even moderate internet use.

The internet is fundamentally changing the way people engage and process the written word and information more generally—reading less of a given piece,[13] moving through information with more superficial interest,[14] quickly shifting from site to site and juggling different activities,[15]

[10] See Carr's *The Shallows*, especially p. 86 for an array of statistics on this.
[11] Small, Gary and Gigi Vorgan, *iBrain: Surviving the Technological Alteration of the Modern Mind* (New York: Collins, 2008), 1.
[12] Ibid.
[13] Sav Shrestha and Kelsi Lenz, "Eye Gaze Patterns While Searching vs. Browsing a Website, *Usability News* 9:1 (January 2007), available at: *http://psychology.wichita.edu/surl/usabilitynews/91/eyegaze.asp.*
[14] Ziming Liu, "Reading Behavior in the Digital Environment," *Journal of Documentation* 61:6 (2005): 700-712.
[15] University College London, "Information Behavior of the Researcher of the Future," January 11, 2008, available at: *http://www.jisc.ac.uk/media/documents/programmes/reppres/gg_final_keynote_11012008.pdf.*

and navigating more stimuli than the brain is capable of processing.[16] The distracting nature of the internet introduces significant "switching costs" as one continually reorients and refocuses through a barrage of different activities. In their research, Diana DeStefano and Jo-Anne LeFevre concluded, "many features of hypertext resulted in increased cognitive load and thus may have required working memory capacity that exceeded readers' capabilities."[17] It is also becoming evident that multi-tasking, an occupational hazard of internet use, is not a strength of the human brain. One particularly worrisome finding is when in the state or habit of multi-tasking, individuals are more likely to accept conventional ideas and solutions without questioning them or considering alternatives.[18]

These dynamics all combine to diminish the internalization of information. Sustained attention and information retention get less likely, with short-term memories dissipating rather than engaging in the processes necessary for the formation of long-term memories.[19] This impedes the ability to build rich schemas and understand complex patterns through concentration and contemplation, the steps that underlie development of expertise.[20] Similarly, Patricia M. Greenfield has found the internet disrupts the deep processing that allows "mindful knowledge acquisition, inductive analysis, critical thinking, imagination, and reflection."[21] Moreover, the knowledge an easily and perpetually accessible information universe is at our fingertips puts less pressure on us to actively retain key information. Not surprisingly, there is evidence the act of remembering makes it easier to learn new information and skills.[22] Similarly, studies have demonstrated the use of software learning aids can actually diminish the capacity to retain and learn.[23]

Considering Potential Implications for Intelligence Organizations and Analysts

With the establishment of an empirical foundation in neuroplasticity, neuroscience researchers have extended this work by testing the effects internet usage and related activity have on the structure and function of the human brain. By examining the differences in brain dynamics between heavy and minimal internet users, and testing cognitive and memory performance using internet versus conventional reading, they have observed rapid and fundamental neuroplastic effects. Some of the findings reviewed above are more worrisome than others, with some being particularly worrisome for the U.S. Intelligence Community.

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[16] Diana DeStefano and Jo-Anne LeFevre, "Cognitive Load in Hypertext Reading: A Review," *Computers in Human Behavior* 23:3 (May 2007): 1616-1641.
[17] Ibid, 1636.
[18] Tapscott, Don, *Grown Up Digital: How the Net Generation is Changing Your World* (New York: McGraw-Hill, 2009).
[19] Kandel, Eric R., *In Search of Memory: The Emergence of a New Science of Mind* (New York: Norton, 2006).
[20] Sweller, John, *Instructional Design in Technical Areas* (Camberwell, Australia: Australian Council for Educational Research, 1999).
[21] Patricia M. Greenfield, "Technology and Informal Education: What is Taught, What is Learned," *Science* 323 (January 2009): 71.
[22] Sheila E. Crowell, "The Neurobiology of Declarative Memory," in John H. Schumann et al. (eds.), *The Neurobiology of Learning: Perspectives from Second Language Acquisition* (Mahwah, NJ: Erlbaum, 2004).
[23] Christof van Nimwegen, "The Paradox of the Guided User: Assistance Can be Countereffective" (PhD diss., Utrecht University, 2008).

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The upshot is all the time people spend, especially younger people, immersed in the internet and its myriad extensions has very real implications for neurological habits and pathways. These habits and pathways are brought into the workplace—for the purposes of this article, the U.S. Intelligence Community. Presuming the average age of a new intelligence analyst is 25, there is a good chance that person has spent three-quarters of his or her life regularly using cyber technologies. As a group, the analytic hires in 1993 had a very different experience using the internet than those joining the U.S. Intelligence Community in 2013. No doubt the intelligence workplace is already heavily populated by "digital natives." While the implications of this will vary for different kinds of analysts, it is hard to imagine any type of analytic work being enhanced by diminished abilities to concentrate, think critically, retain information, or develop rich conceptual schemas. As demonstrated below, the intelligence workplace can often interact with and in some cases replicate the worst things about the internet. Perhaps the newest manifestation of this is the increasing use of social media as an intelligence source, a topic that receives special attention at the end of this section.

One thing is certain: the internet is here to stay, and probably in an ever more pervasive fashion as people carry around smartphones and other internet-ready devices. To be sure, that reality offers a number of benefits to be maximized, though the potential costs must be taken just as seriously. In this section, we turn to a discussion of how these benefits and costs might manifest in contemporary intelligence organizations, specifically the U.S. context. Of central interest is how the neuroplastic effects of internet use might affect and interact with the work and workplace of intelligence analysts.

First and foremost, the internet gives analysts direct access to more data, and more sources of data. Open source intelligence (OSINT) is (quantitatively) dominant among the various forms of intelligence, with typical estimates at 80 to 90 percent of the information available to U.S. intelligence organizations.[24] The contemporary predominance of OSINT is in part enabled by the internet.

Of course, it is important to remember the internet also gives policymakers more access to alternative sources of information, which can have both positive and negative effects. But, this dynamic can reduce policymakers' reliance on the input of intelligence organizations. The pressure for intelligence analysis to stay relevant might also compel intelligence organizations to rapidly issue products based in part on dubious, poorly vetted information.[25] This could contribute to a higher frequency of intelligence error or failure, which in turn could further erode policymaker regard for the work of intelligence organizations. In a culture where production quantity is emphasized,[26] analysts are likely to spend less time and attention checking and refining their analyses.

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[24] Richard A. Best, Jr. and Alfred Cumming, "Open Source Intelligence: Issues for Congress," *Congressional Research Service*, available at: *http://www.au.af.mil/au/awc/awcgate/crs/rl34270.pdfhttp://www.au.af.mil/au/awc/awcgate/crs/rl34270.pdf.*

[25] Joshua Rovner, "Intelligence in the Twitter Age," *International Journal of Intelligence and Counterintelligence* 26:2 (Summer 2013): 260-271.

[26] Lahneman, William J., *The Future of Intelligence Analysis* (College Mark, MD: University of Maryland, Center for International Security Studies, 2006); Marc Sageman, "The Stagnation of Research on Terrorism," *The Chronicle of Higher Education*, April 30, 2013, available at: *http://chronicle.com/blogs/conversation/2013/04/30/the-stagnation-of-research-on-terrorism.*

The increase in information available to policymakers and analysts, largely brought about by the internet and related applications, has been accompanied by tools which allow for the efficient and complex processing of information. The U.S. Intelligence Community has seen its processing capacity increase markedly with tools like Palantir and Analyst's Notebook, and data mining technologies. These systems are bringing an analytic power that in most cases the human mind is simply not capable of realizing. However, these tools cannot replace human judgments on things like data reliability, which remain very important for sound intelligence analysis.

In fact, an advanced facility with the internet and all its resources may help analysts sift through information rich environments more quickly and effectively.[27] Some intelligence analysts have as their core task integrating and reconciling many disparate pieces of information. Current intelligence, while often criticized as too heavily emphasized in the U.S. Intelligence Community, is a critical function, and the ability to rapidly assimilate different kinds of intelligence a highly valued skill set.

However, as analysts shift from one bit of information to another, using myriad systems and sources, high switching costs and the attendant negative effects are an occupational reality. Thus, the nature and structure of their work assignments could in fact reinforce the disrupted modes of thinking that follow from heavy internet use. Thus, key skill sets that may already be flawed or lacking will be further compromised. For example, analysts—including current intelligence analysts—are well served by a strong capacity to internalize information and build and modify conceptual schemas accordingly. The previous section demonstrated the negative effects heavy internet use can have on these capacities. Such analytically important functions as pattern detection are compromised if information retention and conceptual thinking are diminished. Similarly, studies have found deleterious cognitive effects of multi-tasking, including an uncritical acceptance of conventional ideas and the status quo.[28] Thus, recognizing events and information that suggest a new path or dynamic, already a major and broadly recognized challenge for intelligence organizations, becomes that much more difficult. Diminishing capacities for deep reflection, imagination, and the ability to develop and grow the complex conceptual schemas that underlie true expertise pose an even greater threat to the work of long-term, strategic intelligence analysts. This type of analysis requires the ability to grapple with complexity and deeply understand social settings (a group, an organization, or a country) and phenomena.

A good example, pertaining specifically to creativity and imaginative analysis, is the ability to utilize structured analytic techniques like Alternative Competing Hypotheses. The intelligence literature commonly stresses the importance of analysts having a creative bent.[29] The U.S. Office of the Director of National Intelligence has codified creativity as a competency area for intelligence analysts. Having those skill sets, among other things, allows analysts to develop a larger number and variety of hypotheses to be tested. Creativity and imagination probably

[27] Small and Vorgan, *iBrain*, p. 21.
[28] Tapscott, *Grown Up Digital*.
[29] Michael W. Collier, "A Pragmatic Approach to Developing Intelligence Analysts," *Defense Intelligence Journal* 14:2 (2005): 17-35; Heuer, *The Psychology of Intelligence Analysis*; Kent, Sherman, *Strategic Intelligence for American World Policy* (Hamdon, CT: Archon Books, 1965); Lahneman, *The Future of Intelligence Analysis*.

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become more critical as the time horizon extends out, as more factors impinge upon outcomes and it becomes more difficult to discern relevant information. The possession of deep expertise and rich conceptual schemas is also important here; creativity tethered by expert knowledge and an ability to grapple with significant complexity is a necessity for strategic intelligence analysts.

Lastly, the internet and the tools it enables can encourage a culture of connectivity among different parts of the U.S. Intelligence Community. This can help overcome some of the information sharing problems that have contributed to intelligence shortcomings. Different software applications can help structure and codify interagency relations around information sharing. For example, use of the U.S. Homeland Security Information Network (HSIN), including its online communities of interest and virtual meeting space, can allow for the fluid, organic exchange of information and ideas. Further, programs that automatically provide information pertinent to an area of interest save time and highlight information one might otherwise overlook.

Of course, such tools can also mimic the frenetic internet environment, encouraging and reinforcing disrupted and outsourced cognitive habits. In fact, the U.S. Intelligence Community now has a Twitter counterpart, Chirp, which is accessed through Intelink and used for posting information and events of importance to intelligence professionals. Internal person-to-person chat systems like IBM's Sametime can also be found in the U.S. Intelligence Community. Thus intelligence analysts, while working, can be chatting with friends and colleagues while regularly checking Chirp for news and updates. This sounds a lot like how we use the internet in our private lives: constant connectivity and lots of switching costs as we move from one distraction to the next.

As has been shown, the benefits of the internet and related software programs are diverse and profound. The U.S. Intelligence Community should continue to exploit every advantage such technologies afford. These advantages have become even more critical as intelligence analysis is increasingly relevant to and practiced in state and local governments. However, potential costs abound as well. Measuring and managing the trade-offs of all these applications and issues will be an ongoing, complex undertaking. One of the most interesting examples of the U.S. Intelligence Community responding to a changing sociotechnological environment is the growing role of social media as an actual source of intelligence. The next section takes a closer look at some of the issues and efforts around this development, one that adds and amplifies neuroplasticity considerations pertaining to extensive internet use.

Social Media Intelligence (SOCMINT)

Increasingly, intelligence analysts are likely to bring internet-induced cognitive habits to the workplace, one already characterized by immense amounts of information, a demand for production, and rhythms and systems that reinforce a frenetic engagement with information. Analysts are also beginning to rely on the very cyber applications that most contribute to distracted cognitive states, including social media. Nowhere is the frenetic nature of the internet and instant gratification from real-time information more present than in social media platforms. Social media gives us another button to push to get more information, but at the cost of frequent distraction and high switching costs. Carr has observed, "We want to be interrupted, because

each interruption brings us a valuable piece of information."[30] This is especially true for an intelligence analyst whose day-to-day job revolves around collecting, organizing, and analyzing large quantities of information.

Moreover, social media adds to an information environment that is already overwhelming. The influx of all this information is often unvetted, posted anonymously, and fluid in nature. This makes it extremely difficult to judge data reliability, an important step in processing raw intelligence. While this is not a new issue, it is magnified due to the ease with which the information flows. False information can spread quickly through the news media, creating an "illusion of truth" as a story is picked up by multiple outlets. Social media users will be aware of this dynamic and can feed disinformation—gaming, as David Omand et al. label it.[31]

To be sure, social media's ability to spread information quickly, especially from areas where reporting is scarce, can be very useful for intelligence analysts. In the age of social media and smartphones, private citizens can easily become collectors of OSINT, whether on the streets of a major U.S. city—like in the Boston Marathon bombings in April of this year—or behind the scenes of an opaque regime—like in Iran's 2009 Green Revolution. Social media can even inform strategic intelligence, as is illustrated by the Arab Spring revolutions that swept through the Middle East and North Africa beginning in December 2010. A 2011 study found social media played a key role in the Arab Spring unrest and events. The study analyzed over 3 million tweets, thousands of blog posts, and gigabytes of YouTube content, concluding that discussions on revolution frequently preceded actual events on the ground.[32] This knowledge is important to intelligence organizations. It demonstrates the possibility that indicators in social media could assist in predicting future events.

Whether it is getting a look inside events as they unfold or dynamics within a relatively closed society, identifying potential "lone wolf" terrorists, or working to maintain policymakers' attention, social media intelligence, or SOCMINT, will likely play a larger and larger role in the daily work of intelligence analysts. Omand et al. have urged SOCMINT be fully incorporated into the various forms of intelligence already used by U.S. intelligence organizations.[33] Joshua Rovner suggests intelligence managers hire analysts who are very adept at social media navigation.[34] In fact, the New York City Police Department already has a cyber intelligence unit concerned chiefly with monitoring jihadi web forums.

Accordingly, Omand et al. have stressed the importance of developing the field of "social media science," in part to help meaningfully and responsibility use SOCMINT to support foreign and security policy. They have also devised an early framework for approaching the use of SOCMINT, highlighting normative (like privacy) and pragmatic (like efficacy) considerations.[35]

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[30] Carr, *The Shallows*, 133.
[31] Omand, David, Jamie Bartlett and Carl Miller, "Introducing Social Media Intelligence (SOCMINT)," *Intelligence and National Security* 27:6 (December 2012): 801-823.
[32] Project on Information Technology and Political Islam, "Opening Closed Regimes: What was the Role of Social Media During the Arab Spring?" 2011, available at: *http://pitpi.org/wp-content/uploads/2013/02/2011_Howard-Duffy-Freelon-Hussain-Mari-Mazaid_pITPI.pdf.*
[33] Omand, "Introducing Social Media Intelligence."
[34] Rovner, "Intelligence in the Twitter Age."
[35] Omand, "Introducing Social Media Intelligence."

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Recommendations for Intelligence Organizations and Analysts

This section will outline some broad recommendations for the U.S. Intelligence Community which could help mitigate the negative cognitive effects of internet use. Simply having an awareness of the issues and pitfalls discussed in this article would represent a major first step. Additionally, being cognizant of online actions and habits outside the workplace, and taking measures to manage that activity, is probably no less important.

Incorporating content on the neuroplastic and cognitive effects of the internet into intelligence curricula and training modules could be a broader educational step. This would be akin to use of the popular Richards J. Heuer Jr. text, *The Psychology of Intelligence Analysis*. Similarly, the development of new exercises and technologies geared specifically toward intelligence analysts could help apply neuroplasticity in a positive way. Technologies, such as the online software Lumosity, which take advantage of neuroplasticity are already emerging in the mainstream marketplace.

Perhaps the most obvious and easiest daily task would be for intelligence analysts to set aside time to work away from their computers in quiet spaces. This does not mean foregoing sources found online, but, for example, simply printing out longer or multiple documents. Use of printed materials will mitigate such things as switching costs by eliminating the distractive elements of hyperlinks, updated social media feeds, and email. Instead, intelligence analysts can fully engage the material, with the benefit of greater retention and integration of information. Similarly, it is important to think about the rhythms of the workplace. While the fast-paced nature of many intelligence offices cannot be avoided, studies have shown taking breaks and spending time in quiet settings can calm and enhance cognitive function.[36]

The internet and associated applications should be viewed as tools in a toolkit meant to supplement an analyst's ability to gather and process information. It should not be a window through which all information is viewed. Applications like Analyst's Notebook, Palantir, and automated text reading are intellectual technologies designed to supplement and bolster an analyst's judgment, not replace it. Likewise, the internet cannot take an overly prominent role in the analytic process.

Similarly, intelligence analysts should engage in a variety of assignments, ranging from current intelligence to more strategic assessments, in order to exercise different neurological pathways and use different skill sets. Admittedly, this will not always be easy for intelligence organizations and offices. Alternatives could include professional rotations (which are common) and the use of more diversified analytic methodologies. A variety of analytic methodologies are available. For example, the field of intelligence analysis has long been concerned with issues like groupthink and acceptance of traditional wisdom over creative thought. The development of various analytic methods over the years has sought to combat these behaviors. Devil's Advocacy, Alternative Competing Hypotheses, and Red Cell exercises can spur creative thought, exercising and strengthening different neurological pathways.

[36] Marc G. Berman, John Jonides and Stephen Kaplan, "The Cognitive Benefits of Interacting with Nature," *Psychological Science* 19:12 (December 2008): 1207-1212.

Lastly, intelligence organizations would be well advised to be careful in their selection and adoption of cyber and software technologies. Intelligence managers should be wary of applications that may overly mirror the internet, distract readers and diminish retention, or externalize problem-solving in ways that prevent analysts from engaging in rigorous thinking. What may seem to be helpful may turn out to be harmful to learning and cognitive processes. Once systems and practices are adopted it is much harder to replace them.

Conclusion and Future Research Steps

The neuroplastic effects of the internet, social media, and other related applications have important implications for the U.S. Intelligence Community. Studies have shown these technologies are fundamentally changing the way people engage information, which in turn has compromised cognitive functioning in a number of critical ways. These issues will likely become more evident as new generations come into the U.S. Intelligence Community. The intelligence workplace can sometimes exacerbate the problematic dynamics associated with the neuroplastic effects of internet use. Of course, there are some simple mitigation steps that can be taken, and neuroplasticity can be applied to positive ends.

This article is meant to be an introductory foray into a rather complex topic. Future empirical study is warranted to more directly examine, understand, and hopefully mitigate the negative neuroplastic and cognitive effects of the internet in the context of intelligence. The Central Intelligence Agency's Scholars in Residence program could be one way of doing that, perhaps beginning with a simple survey of intelligence analysts and managers. Analytic and retention tests could also be performed—similar to many of the studies discussed in this article—with intelligence analysts. The university-based Intelligence Studies Centers proposed by Stephen Marrin and Martin Rudner could offer another venue for research and experimentation.[37] Test environments and assignments can mimic the work of intelligence organizations and analysts, as is done in the Brunel Analytical Simulation Exercise (BASE) at Brunel University in London.[38] This could include comparing and contrasting across the range of analytic jobs, as well as the federal, state, and local levels.

Tracking developments in neuroplasticity research and technology more generally is an important environmental scanning activity for the U.S. Intelligence Community. Findings and advances in the field could be put to great use in the world of intelligence analysis. If new sources of analytic pathology and intelligence error are emerging or we learn to mitigate those already present, it is incumbent upon responsible managers and overseers of intelligence to take appropriate action.

[37] Stephen Marrin, "Intelligence Studies Centers: Making Scholarship on Intelligence Analysis Useful," *Intelligence and National Security* 27:3 (June 2012): 398-422; Martin Rudner, "Intelligence Studies in Higher Education: Capacity-Building to Meet Societal Demand," *International Journal of Intelligence and Counterintelligence* 22:1 (March 2009): 110-130.

[38] Philip H.J. Davies, "Assessment BASE: Simulating National Intelligence Assessment in a Graduate Course," *International Journal of Intelligence and Counterintelligence* 19:4 (November 2006): 721-736.

http://scholarcommons.usf.edu/jss/vol6/iss3/7
DOI: http://dx.doi.org/10.5038/1944-0472.6.3.7