The Left- and Right-Brain Myth

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Although the Internet has provided people with nearly unlimited access to seemingly endless topics, the accuracy of this information is not guaranteed. A primary advantage of the Internet – that anyone can publish almost anything and that information spreads virally – is also a double-edged sword. Complex scientific topics are often simplified and diluted to a fault for non-scientists, or lay people, to understand. Research from subjects that directly relate to people's everyday lives, like psychology, appear to experience the greatest misinterpretation on the Internet. In fact, an entire genre, coined "pop psychology," describes the antiquated, unproven, oversimplified, misunderstood, and misinterpreted psychological concepts promoted by non-scientists that are prevalent throughout the World Wide Web (Lilienfeld, Lynn, & Beyerstein, 2010). One very prominent psychology myth that has persisted for decades concerns brain lateralization. Despite the studies that have illuminated the details of brain lateralization and articles devoted to debunking this myth, numerous social media websites continue to offer quizzes and articles that reinforce the belief that some individuals are right-brained, which means they are the creative type, and some are left-brained, which means they are more mathematical and logical.

Humans have large, complex brains compared to those of other animal species, including among mammals and even primates. These two features allow for great specialization and capacity. Scientists have pursued the location and relationship of different brain functions, but did not always have the technology or means for discovery. Until the mid-20th century, psychologists relied on case studies of individuals that had survived brain injuries, like Phineas Gage, to understand the human brain's functional specialization (Stern, 2010). In the 1940s, doctors began to treat patients with extreme epilepsy by removing the primary tissue connecting the two cerebral hemispheres, a procedure called a corpus callosotomy (Pines, 1973). This

prevented seizures originating in one hemisphere from spreading to the other. These individuals then served as subjects for split-brain studies in the ensuing decades, providing researchers with a platform to base theories of functional specialization. These early conclusions about hemispheric lateralization morphed into the contemporary myths regarding left-brain and right-brain dominance.

However, the brain's actual lateralization is much more complicated (Corballis, 2014). While this feature explains a person's preference for their left hand or right hand, the brain is incredibly more complex than a hand. One hemisphere is decisively not dominant over the other. But just because one hemisphere is not dominant over the other does not mean that each hemisphere is identical. For example, scientists discovered over a century ago that the left hemisphere is usually related to language processing. Different regions of the brain complete different functions, which will inevitably lead to some lateralization. But this does not apply to all or most brain functions. Tasks traditionally associated with a single hemisphere, according to the myth – like creative thought, are not limited to one hemisphere (Corballis, 2014). Ellami, Dobson, Beeman, and Christoff (2012) illustrated with brain scans that a vast neural network activates during creative thought and does not favor either hemisphere. Basically, the brain is like a large complex machine with multiple important parts. There are specialized locations, but the right and left side both have special processes that are localized, complementing universal processes that involve both hemispheres. But this in no way leads to the conclusion that one hemisphere will dominate the other or that the two hemispheres. Unfortunately, complex anatomy and detail are often lost during a scientific idea's translation to the general public, who prefer to apply simpler, familiar concepts, like left hand or right hand dominance, to new and complex scientific ideas.

The genesis of this myth began with research conducted by neuroscientist Michael Gazzaniga (Connors & Stein, 1993). During the 1960s and ensuing decades, Gazzaniga collaborated with his advisor, fellow neuroscientist and Nobel laureate Roger Sperry, to explore communication between the brain's two hemispheres. As they studied the impact of split-brains in monkeys and cats, they noticed that the behavior of these animals changed (Nakamura & Gazzaniga, 1978). Once disconnected from one another, the brain's hemispheres disrupted one another during tasks. More research, especially with split-brain humans, ultimately helped them to conclude that the brain's hemispheres do not have identical functions. This corroborated evidence from the previous century that had pointed towards functional lateralization, specifically the idea that verbal processing took place in the left hemisphere for most people. Now undisputed, the theory of functional lateralization was ready for consumption by the general public.

Perhaps the earliest, influential article promoting the myth of hemispheric dominance was written by Maya Pines for the New York Times Magazine in 1973, titled "We are left-brained or right-brained: Two astonishingly different persons inhabit our heads" (Pines, 1973). Presentation in such a respected and far-reaching periodical gave undue credibility to this single journalist's interpretation of, at the time, cutting-edge science. In her article, Pines writes in depth about the implications of brain lateralization. However, as a non-scientist she not only misinterprets this research, but also fancifully exaggerates the conclusions. While the title alone overstates the scientific conclusions, she continues to present the two hemispheres of the brain as though they are unique units, like brains of "Siamese twins" (Pines, 1973). She provides a thorough summary of the current research at that time, but presents imaginative consequences from this knowledge, insinuating that, "many of man's more poetic or imaginative aspects may stem from [the right

hemisphere]" (Pines, 1973). A century of research on functional lateralization had been boiled down and packaged into a single article targeted for a broad, non-technical audience. Now this myth could grow stronger and more pervasive than ever before.

But how could a single non-scientist writer exert so much influence? Perhaps this is related to the innate curiosities of humans. People seem to have greater interest in psychology than other subjects, especially mathematics, natural sciences, and literature, because this field focuses on human behavior and thoughts, with which every human has experience. Humans are social animals, which requires individuals to cope with the behaviors of others, as well as their own reactions and emotions to others. This causes individuals to seek answers to problems arising from these interactions, because possessing some understanding of the behaviors, emotions, and choices of others is critical to surviving in human society. Therefore, people enthusiastically consume any information that can help explain different thought processes or behaviors. Not only did Pines (1973) use the characteristic embellishment of a successful journalist, she selected a topic that would attract a general audience. This situation demonstrates the danger of distilling complex science into an accessible format, especially when the topic is potentially popular. Now, the Internet and social media have provided even more open space for this myth to roam and spread.

Social media allows people to interact with one another constantly regardless of location. This is a perfect place for this myth to exist. On social media, people are able to witness more human expression than ever before, while it's simultaneously documented. Human behavior has been packaged in such an accessible format that the struggle for people to know more about themselves and others has greatly increased. People strive to understand what makes them act the way they do and makes them who they are, which makes online quizzes and articles explaining

behavior incredibly popular (Caro, 2014). Websites like Buzzfeed.com and Elitedaily.com produce content specifically targeted toward social media users that answer these fundamental behavioral questions. Unfortunately, scientists do not write these articles and questionnaires. Therefore, users will find quizzes that promote hemispheric dominance myth (Rosa, 2014). On Buzzfeed.com, a person can complete multiple quizzes to find out whether they are right-brain or left-brain dominant (Rosa, 2014). Facebook and other social networking platforms allow users to share web content, spreading these quizzes virally.

This myth has become so encrusted in American culture that public relations officials and corporate consultants peddle advice based on this to their clients. According to Budd (1997), the brain hemispheres are partners that complement one another's skills. He asserts that an effective leader will utilize both to maximize their mental skills. This serves to illustrate that lay people, when interpreting the interpretations of other lay people, become farther and farther from the scientific reality. Budd's work comes two decades after Pines original article and he is even less attached to the original research and ignores any new research executed over those two decades. The incentive to make money precedes the incentive to present scientific data accurately.

Despite unfortunate inaccuracy of these articles and quizzes, they do serve an important function for social media users, especially Americans, because they make them feel good. The culture of the United States heavily values individualism. These brain hemisphere tests allow Americans to distinguish themselves from others, reinforcing their individual qualities. Being left-brained or right-brained sounds much more enticing to an individualist than being functionally lateralized – just like everyone else. Therefore, these quizzes help to reinforce this cultural value. Secondly these quizzes help people to preserve a positive self-image. If people can externalize their deficiencies, like their poor math grade or art skills, by blaming it on the

qualities of their dominant hemisphere, then they do not have to take as much responsibility for their flaws. For an American, believing in the dominance of a single brain hemisphere maintains a healthy ego. Feeling unique and externalizing failures are necessary for a healthy life in American society.

The myth of hemispheric dominance illustrates the importance of reading primary scientific literature and not relying on the interpretations of non-scientists, like journalists and public relations professionals. While these individuals have great knowledge in their respective fields, their experience with scientific concepts, especially those that are newer, is likely lacking. Therefore, readers must exercise caution when consuming scientific ideas from these experts. Lay people must also recognize that science is occasionally complex and requires more than a simple analogy to understand, as well as the larger cultural forces shaping the concept and spread of the myth. The bias is not intentional, but due to greater cultural values and naiveté.

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