

# **Our Dance with Technology**

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For many years, technologies such as the printing press and electric light bulb have been almost indispensable in our lives. The printing press enabled us (perhaps even forced us) to become readers, while the light bulb meant that our night times have no longer become a time when we simply fall asleep. Similarly, in recent years we have grown accustomed to communicating in writing with other people via the Internet rather than via letters. Many of us have even moved beyond the Internet and written word to texting and sharing images via social media. I suspect that there are many people now living who have never written a letter. It seems that technology not only leads us to adopt new behaviors, but also abandon old behaviors.

The dance becomes even more intricate as we delve into the functioning of our brains. It is not just a matter of doing more reading and less listening, or spending evening in an alert state, it is also a matter of the way our brain grows when we are children, the way in which it changes as we live through our adult years, and the way in which we remember things, feel about things, reflect on things, and take actions based on our thoughts, feelings and reflections.

## **As Children**

Are we actively interacting with another person (such as our primary caregiver)? This interacting influencing the extent to which we discern the difference between random noise on the one hand, and important noises that soon become known to us as words and as something we can ourselves emit to some effect. We talking to other people, and they react to (and often express joy) in hearing us talk.

Conversely, are we passively watching something on TV while sitting in our cranked-up swing set? If this is the case, then we are less likely to differentiate what is being conveyed by the person talking on TV from other noises in our environment. It all seems like nothing more than a blur. And we are less likely to focus on language and interpersonal relationships. The technology of television has taught us how to be passive recipients of information, rather than active engagers in human relationships.

Interpersonally oriented psychologists and psychiatrists (such as Harry Stack Sullivan) have proposed that our basic sense of self is defined by our relationships with other people. We are one “self” when interacting with our mother, and another “self” when interacting with our best friend or our boss. Some psychologists (e.g. Brothers, 2001) takes it a step further, suggesting that our fundamental sense of reality is invested in our relationships with other people. We are finding out about not just our self but also all other elements of reality through our interpersonal interactions. Without this interaction, our world remains the blur of early childhood. If our early childhood relationship is primarily with a television, then does life remain a blur—since there is no interaction with the T.V. There is only passive reception of visual and auditory images.

## **As Adults**

We now know that there can be alterations under certain conditions regarding the extent to which certain areas of our brain are being used and the way in which these areas are being used. These

alternations can occur well into adulthood – they are not limited to our early life experiences. This capacity for alteration is called neuroplasticity.

At its extreme, neuroplasticity can work magic. For instance, someone who has lost their capacity to see will begin to open up their visual cortex to non-visual functions. They might begin to transfer some of their auditory functions over to the visual cortex. This enables them to be particularly skillful in remembering what other people have said to them or what the content is of an entire piano concerto. They can repeat an entire speech or play the entire concerto.

What about those of us who rely on a specific medium for all or most of our information regarding the world? We zone in on visual and auditory information (coming from our smartphone) and no longer read the printed word. Does our brain begin to assign our visual cortex and/or our auditory cortex some of the space in the region of our brain that is usually devoted to the processing of words (occipital-temporal region)?

Is it just science fiction conjecturing to imagine that our brain will gradually losing its ability to read, while at the same time becoming increasingly attuned to visual and auditory stimuli? Our growing appreciation of neuroplasticity suggests that these fundamental neurological changes can occur over a remarkably brief period of time. We don't have to wait for slow evolutionary change to occur throughout an entire species. Profound neurological changes can occur within the lifespan of an individual person.

## **As Learners**

The way in which our brain operates is at the same time both quite simply and quite complex. In its simple form, the brain is a set of wires that fire together and become even more closely wired together when they fire together. At a much more complex level, the brain operates almost like a holograph, with wave like movement of brain firings occurring across its surface.

The entire brain is always active (except when we are no longer alive), and exists not as a set of isolated units, but as one highly interactive, self-organizing system. And it is a system that is influenced systemically by the external stimuli that trigger the wiring and the wave actions. If these external stimuli are generated by specific technologies, then the nature and content of these technologies influence everything – including the way in which we learn and what we learn.

Much like the child, we can be active or passive learners. We can concentrate on external stimuli or devote much of our attention to stimuli we generate ourselves. Our technologies have something to say about how we learn. They don't just sit out there waiting for us to decide how to use them. I use the term *Human-Embedded Technology* when describing this intimate, interactive relationship. A specific technology such as neuro-electrical stimulation and neurofeedback literally changes the firing of neurons in the brain – we are getting rewired.

At a slightly more remote level, we can revisit the concept of neuroplasticity. As an evolving species, we might not even after to rely on the capacity to relocate or expand specific neurological functions. It might be very simple: one specific lobe is lite up depending on the source of the stimulus. When this lobe gets repeatedly lite up, it will connect with an increasingly large and diverse set of sites throughout the brain. With this neural “enrichment” comes an increasing reliance on the medium associated with this lobe. There is then even greater enrichment and even more reliance. Profound change is occurring based on nothing more than reliance on one specific source of information.

For instance, technology such as texting would lead us initially to rely on written communication and the active involvement of our occipital-temporal region. However, as I noted above, many of us with technologically sophisticated communication devices are moving toward much more visual and auditorial-based modes of communication. These technological devices would lead to enrichment and reliance of the auditory and visual cortex. We wouldn't even need neuroplasticity (though enrichment and neuroplasticity probably complement one another).

But not so fast. We must keep remembering that all of the brain is always lit up and that visual stimuli impact on many regions of the brain, not just the visual cortex, as do words on many brain regions. The wave that is created in the brain when we text shifts the dynamics of the brain in many ways and impacts on everything that we are thinking, feeling or imagining at any one moment. It is all a tightly interwoven fabric or mosaic that changes what we learn and how we learn at any one moment. The models of enrichment and neuroplasticity might be too restrictive and contain too many boundaries to align with this emerging perspective on the brain as operating in a dynamic, holistic manner.

### **As People**

We can move even further out when exploring the way in which technologies are embedded in us. The avatars that we use during our virtual interactions with other people can influence our own self-image (in part because these avatars influence how these other people see us and interact with us). The avatar becomes the new persona that we present to the world—taking the place of how we dress, move and even smell in more direct person-to-person interactions with these other people.

And what about the way in which we observe events occurring at a long distance from us or those that are invented by someone rather than having actually happened? We are exposed to the entire world rather than just our immediate community, and we witness the battles between dragons and knights as well as between sorcerers and children.

At some level, this is all immediate and real. Our bodies and our minds do not always discern the difference between that which is proximal (close in time and space) and that which is distal (distant in time and space), nor between that which is real and that which is imagined. We have always had storytellers and both true and false narratives being told around a campfire, but somehow it has a much greater impact (including usually being both visual and auditory) when conveyed through the new media of our age.

### **Conclusions**

We are constantly interacting with our environment and when some technology is present then we are inevitably going to interact with it. This technology will influence our thoughts, our feelings and our behaviors. We will, in turn, influence this technology – or at least the way in which it influences us.

At a very simple level, for instance, we can ignore a specific technology and move through life trying to ignore it. While some of us, for instance, are fully “addicted” to smart phone communications, others of us choose not to even have a smart phone. More often, however, this technology is deeply embedded in our life and will not leave us alone. We must dance with it and either lead or follow. In either case, there are profound psychological implications that must be carefully explored. Human-embedded technologies are here to stay in our individual and collective psyche.

## **Reference**

Brothers, Leslie (2001) *Mistaken Identity*. Albany, NY: State University of New York.