

Collaborative Innovation What Turns It Off And What Turns It On

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Abstract

As we seek to explore the benefits of integrating collaboration and innovation as a productive strategy in social political and economic contexts, we are ignoring the anthropological evidence that human beings are naturally collaborative and innovative. Rather than exploring how we can add these qualities to our experience, this paper explores why we are not accessing these qualities as a natural strategy. Several questions are posed that explore what turns collaboration and innovation off and what we can do turn them on again. A model is proposed where focus of attention, and the perception of reality that emerges, can be affected by alteration of psychobiological orientation. The ideal orientation of curiosity is proposed with a supporting psycho-neuro-biological discussion of how an orientation of curiosity enables a restoration of our natural, collaborative disposition.

Introduction

It is pertinent that the articles in this inaugural issue address the question: “At this extraordinary time of social, political and economic disintegration, with respect to Collaborative Innovation, what is the most important question to ask and why?” Recent work by the Wright Brothers Institute has explored innovation models for their effectiveness in transactional and transformational growth.

Indications were that the best results were achieved when collaboration and innovation are applied simultaneously. It is, therefore, a reasonable scientific question to want to know why this synergy works so well and how to maximize the benefits in our social, political and economic spheres. Human beings, however, are,

by nature, one of the most collaborative and innovative species on the planet. Collaboration and innovation are fundamental qualities that have enabled our species to survive. There are words used in other topics of discussion that synonymously describe human development, including adaptive, responsive to environmental change, social, interactive, interpersonal, and co-operative.

Edward O. Wilson (2012) describes the quality of *eusociality*, shared with ants, bees and termites, where a species instinctively acts as a collective in order to achieve benefits for both the individuals and the group. We are also the most socially engaged and communicatively developed species (Frith & Frith, 2010, Levinson & Holler, 2014). The question regarding how we might become more collaborative and innovative, may be better framed as, “What happened in our socio-cultural development that de-normalized collaboration and innovation and normalized individual and even isolated behavior?”

What Separates Us

Philosophies, such as *solipsism*, have argued the separateness of the human mind and therefore human experience. Solipsism describes being self-centered or selfish as reasonable, based on the idea that the self cannot be aware of anything other than itself and that an individual cannot be sure of anything outside their own mind (Oxford Dictionary, 2019). This concept originally emerged from Greek pre-Socratic sophist, Gorgias (c. 483–375 BC) (Craig, 1995).

Accepting this proposition, and it is arguably one of the foundations of various cultures, including the USA where the individual is, ostensibly, expected to succeed independently. On this basis, it is not difficult to imagine the development of a social belief that connection between individuals is optional, potentially unrewarding or an interference, and difficult. Over time, such a belief is likely to interfere with our natural inclination toward collaboration creating a perception of reality based more on distrust and fear of others than on collaboration which has

become reframed as an interference to the individual's pathway to social, political and economic success.

In such a world, collaboration requires a cognitive decision and a volitional act. The creation of this journal is just one indication that this description of a solipsistic perception of reality is pertinent. Individualism, however, is not a manipulated or unnatural disposition. Wilson (2012) argues that although we have become hard-wired to co-operate in groups, we also have an individual and self-concerned drive for survival. Part of the human condition is the discord between these two impulses. The question now becomes: What do we need to understand about us as a species that can be utilized to restore a positive acceptance of our natural, collaborative disposition?

What Connects Us

One of the most compelling discoveries about our non-volitional connection to others, is the existence of mirror neurons. These are a set of neurons in the motor and pre-motor area that respond to movement when observing another *as if* making that movement yourself. This shared neural experience of movement enables the observer to assess the intentions and compatibility of the observed prior to reflective consideration: the activity of one exists within the brain of another, directly connecting the two "selves" (Gallese, et al, 1996; Kaplan & Iacoboni, 2007). Natural processes like this show that humans have an automatic and unavoidable response to the presence (and the absence) of other people for the distinct purpose of enabling and enhancing interaction and social engagement.

Other obvious capacities are language and gesture, whose principle purpose is to communicate mental states across the "social synapse" (Cozolino, 2013; Stephani & Marco, 2019), defined cornea of the eye to enable others to know and follow the direction of eye gaze (Tomasello, et al., 2007) and empathy, which enables us to have a felt sense of another to enable and enhance emotional engagement (Riess,

2017). These all are implicit capacities that contribute to our natural connection, social engagement, collaboration and co-operative creativity.

The Social Engagement System

Stephen Porges (2003) has argued, in his *Polyvagal Theory*, for the existence of a phylogenetic hierarchy that has, as the most recent evolutionary development, a social engagement system (ventral vagus). This system includes many of the suggested implicit processes above that enable and enhance social engagement. The other two elements of the hierarchy are the sympathetic nervous system, in response to threat, producing fight, flight, or freeze; and the parasympathetic nervous system (dorsal vagus), in response to overwhelm, producing collapse.

This helps us understand how it might be that we have lost the “normality” of social engagement, collaboration and co-operative creativity, which underscore the emergence of innovation in groups. Turning off the social engagement system occurs when the sympathetic nervous system is aroused in response to threat or perceived threat, danger or perceived danger. Our question now turns to what might be triggering feelings of fear or fearfulness to the degree that people are less inclined to connect, engage and be co-operative: what inclines us toward self-concern and self-defence?

What Turns It Off

Chronic Stress and External Evaluation

There are those things that are clear and present dangers – specific threats, dangers, and violence. These are immediate threats that trigger fight or flight and are often short term and resolvable. What is more difficult to resolve are those threats that are persistent and unresolvable, that lead to a chronic state of fearfulness. This triggers a chronic and usually low level of sympathetic nervous system activity which is not something humans have evolved to manage.

Robert Sapolsky describes in his book, *Why Zebras Don't Get Ulcers* (2004), that we have evolved to deal with the bear that jumps out from behind a rock, but not the 30-year mortgage. Aronson and Steele (1995) show that chronic threat can be experienced in the pervasive social attitudes that they describe as *stereotype threat*. Their research investigated African Americans and intellectual test performance. It was found that when asked to simply complete a questionnaire the participants performed at expected standards. When the test was described as an I.Q test and their performance would be measured and would affect their end of year scores, the African American group's performance was 6% lower. There was a negative impact on performance that was attributed to the pervasive negative social opinions about that group's intelligence.

These results can be extrapolated to other minorities or disadvantaged sectors of society that are negatively criticised or oppressed by dominant social attitudes. The impact of externalised social evaluation systems has also been described as like living in a *winner/loser world* (Hill, 2006) where winning and losing is determined by external standards created by the dominant social group. This generates a low level, chronic aggravation of the sympathetic nervous system and a subsequent dampening of the social engagement system.

This is an avenue for future research as a likely contributor to the inhibition of natural collaboration. How much chronic threat exists in a workplace where pressures and demands are externally determined? Pressures such as KPI's that are more based on economic constraints than on innovation, development and personal capacity. Equally, how has the competitive tone of the workplace led to people working in isolation to either reap the offered rewards or avoid scrutiny? These questions have anecdotal support, but further research is required.

Trauma

I suggest we have underestimated the degree to which these chronic, background

stresses and threats create an environment and events that are not only stressful, but also traumatic. Trauma is when dangerous, threatening or violent experiences are unresolved and remain within the person as a post-traumatic stress. Chronic trauma is equally likely to also produce an unresolved sense of safety in response to a low level of persistent failure to resolve daily experiences. Traumatic experiences can cause a “stuckness” in development that can manifest as impairment in empathy, sensorimotor development, impulse control, memory and self-esteem (Cook, et al., 2005).

Neural pathways relating to the traumatic experience can get the most activation which reduces the formation of other pathways concerned with adaptive learning and behavior (Perry, 1995). Chronic trauma is likely to produce a similar “stuckness” arising from the exposure to chronic traumatic threats such as social expectation and demand, bullying, coercive control, competitive materialism, and the isolating and dissociating impacts of the critical elements of social media. It is these non-specific traumas that contribute to feelings of isolation, dissociation, vulnerability and defensiveness that are prevalent in the modern world, even when there is no distinct traumatic event.

People who deal with other people’s problems, such as managers, HR departments, Board members and executives are susceptible to what is described as “vicarious trauma” or “secondhand experience” of traumatic events (Canada Life, 2019). This is often experienced in medical and mental health professionals (Baird & Kracen, 2004). There are many stressful and traumatic influences that affect the population and I propose that, collectively, these are causing a down-regulation of collaboration and co-operative creativity and an upregulation of self-concern, dissociation and isolation. The question now is: how do we alter our psychological state so that it alters our state of conscious awareness in order to revive our natural disposition for social interaction and collaboration and the subsequent benefits of co-operative creativity and innovation?

What Turns It On

Conscious Awareness, Focus of Attention and Orientation

A fundamental element of our conscious awareness is the quality and focus of our attention. To answer the question above, I propose a model incorporating the quality of our focus of attention. Where we direct our attention determines what we notice, what we are drawn towards and what might be attracted towards us, collectively creating our conscious perception of reality (Posner & Rothbart, 1998). Our focus of attention is oriented by our mental state, which is a combination of internal and internalised attitudes, emotions, and our state of affective order and/or disorder (Oosterwijk, et al., 2012).

So, our orientation directly affects our perception of reality. In colloquial terms, the way you perceive the world affects the way you act in the world you perceive, and this is affected by your emotional disposition and/or your mental attitude at the time. When someone is oriented by a positive state such as happiness, or love, or contentment there will be a different focus of attention, and subsequent behavior and thinking, than someone oriented by a negative state like anxiety, depression or anger.

The pressures of external expectation and evaluation, which are described above as the “winner/loser” mental state, will orient the individual toward a chronically stressed and traumatised mental state that triggers behaviors including dissociation, defensiveness/aggression, fault and blame shifting, distrust and social isolation – all qualities of mind that are not conducive for collaboration or creativity or innovation. In recent years there has been strong support for mindfulness practices as an orientation that might resolve the “winner/loser world” problem. This has certainly helped to create an orientation of calm and shifted thoughts toward a more accepting and non judgmental frame.

Mindfulness has been shown to produce a positive shift in the psychobiological state in workplaces (Good, et al., 2016), schools (Semple, Drouman & Reid, 2017) and for individuals (Keng, Smoski & Robins, 2017) and relationships (Karremans, Shellekens & Kappen, 2017). The extensive research is helpful to confirm the underlying principle of the model, that orientation alters behavior and mental activity, but it is not necessarily conducive to collaboration for the purpose of co-operative creativity and innovation.

In addition to the preparatory mindfulness benefits of recovering calmness, self-awareness and non-judgementalism, we need to reinvigorate collaborative innovation with an orientation that will turn on positive emotional drives and shift the focus of attention toward creative engagement, exploration, positive anticipation, clarity of thought, and endogenous rewards. I propose the most effective orientation to achieve all those qualities is curiosity. No other orienting state, including mindfulness, stimulates all the qualities required.

Prior research has generally limited curiosity to desire to satisfy a deficit in knowledge, a desire for information or the questioning of how things work (Litman & Jimerson, 2004). This is clearly insufficient. If all we needed was more information, then we should be the happiest and most collaborative society in the history of humanity. According to Forbes magazine (Marr, 2018), 2.5 quintillion bytes of data are created each day. 90% of the data in the world was generated over the last 2 years. Instead of inspiring our wonder and fascination, we are accosted by a relentless torrent of new information, commentary, social criticism, and self-serving agendas that are trying to win our attention, our loyalty and, more often than not, our money.

This is the current equivalent of what Alain de Botton was warning us in his book, *Status Anxiety* (2005) more than a decade ago, which is a parallel concept to the “winner/loser world” (Hill, 2006). Nowadays we have a morbid fear of not knowing. So much so that people will even make things up in what psychologists call

an “argument from ignorance” (Robinson, 1971) just to appear to be knowledgeable. Curiosity for information, surprisingly can be seen as a negative because it implies that the person doesn’t know everything and is somehow a “loser”.

Curiosity

I propose that curiosity is comprised of three irreducible facets that collectively produce the necessary psychobiological state to revive our natural disposition for social interaction and collaboration, and the subsequent benefits of collaborative creativity and innovation.

The three facets of curiosity are: Curiosity of Information (CFI), Curiosity for Play (CFP), and Curiosity for Meaning and Possibility (CFMP). Although these facets can be differentiated for discussion and examination, they are three aspects of a single quality, where each can be the dominating facet at a given moment, but activation of one facet can facilitate the activity of another. It is the isolation of one facet that changes the nature of its function to something other than curiosity. Seeking only information, for example, can produce stress which turns curiosity off, as described above.

- CFI is the application of curiosity to something specific. This is curiosity for what is not known, to fill a lack of knowledge, of understanding, of experience or of perception. Curiosity, though not dependent on the cortex, can be generated in response to top-down thinking. Determining what to be curious “about” becomes a cognitive, rational process.

- CFP is a wonder, an interest, a fascination in whatever is happening now. Play is utilized to enable serendipitous and unexpected emergence of learning, realization and insight. CFP is a pleasurable and playful aspect of curiosity that is often seen in children, but also in adults when the weight of responsibility for past or future is lost in the pleasure of playful exploration. Play is different from organized game-

playing in that it is unregulated, undirected, and self-organizing. Information emerges from the experience.

•CFMP is the facet of curiosity that seeks something beyond the information, whether discovered (CFI) or emergent (CFP). CFMP is characterized by a sense of wonder and fascination about what is possible *because of* the information being revealed or the insight that spontaneously emerges. CFMP utilizes our natural creative capacities for metaphor and representation; our instinctive drive for meaning, self-reference, group-reference and innovation; our sense of wonder for what else might be possible and what might be created.

The benefit of curiosity as an orientation is that, even when beset by some of the negative influences described earlier, curiosity can incorporate even those debilitating issues as something to be curious about. A curiosity orientation can be applied to any situation with these 3 simple steps:

1. Be interested: That's interesting! – this turns on the curious mental state.
2. Ask: What is this really all about? – acknowledges that there is more to the situation than meets the eye.
3. Wonder: What can I create with this? – engaging the sense of possibility for change, growth and creativity.

As an example: In the dramatic film production, *The Freedom Writers* (DeVito, 2007), which is based on a true story, the film begins in the childhood years of one of the students witnessing a drive by shooting. Her voiceover tells us, "... and I saw the war for the first time." The story follows the experiences of teacher, Erin Gruwell, in her struggles to teach English at the Woodrow Wilson Classical High School in Long Beach, California, in 1961. Minority students were bussed in from disadvantaged neighborhoods.

In a memorable scene, Gruwell draws a line on the floor and asks students who know someone who has been killed to step over the line. Every student steps

across the line, except for one Caucasian boy. As Gruwell increases the number of people who they know that have been killed, many students remain across the line. Their pain and discomfort and their total lack of curiosity is obvious. Their lives are about survival, not adventure or exploration.

Gruwell tries to reach out to the students and is finally successful when she takes them to the Jewish Holocaust Museum. For the first time the student's minds were opened to possibilities they had never contemplated. Gruwell then takes them to visit Holocaust survivors. Their curiosity about these people, who had suffered beyond their own suffering, triggered insight and change. Gruwell asked them to write their stories, which were eventually published as a book.

Gruwell shifted their mental state from one of stress, of chronic sympathetic nervous system activation, to a state of wonder and interest in something outside of themselves, that also gave their lives some meaning and especially some perspective. This allowed them to grow. They collaboratively produced the book. This collaborative and innovative way of combating the stress and trauma of their violent community, emerged out of a curiosity orientation that embraced their stress and trauma, rather than tried to avoid it, repress it or just reframe it.

The Psychobiology

Does curiosity alter the psychobiology? Whenever there is a change in mental state, there is a change in the activity of the brain. The qualities of collaboration and innovation are similar to the qualities the literature indicates for curiosity. In order to be curious, there needs to be a sense of anticipation; focus, attention and arousal; an engaged, 'towards' sense of exploration; a reduction in negative affect and fearfulness; and a satisfying, euphoric reward at points of resolution, insight or realisation. Although this may seem very technical, it is relevant to appreciate that there is a neurobiology of these states and it is well established:

- positive anticipation – dopaminergic activity from the *substantia nigra/ventral tegmental area* and *nucleus*

accumbens (Knutson et al., 2001; Gruber et al., 2014);

- focus and attention on issues that interested them - norepinephrine from the *locus coeruleus* (Ashton-Jones & Cohen, 2005) and acetylcholine from the *nucleus basalis* (Buzsaki & Gage, 1989);
- calming of stress and hypersensitivity – serotonergic activity from the *raphe nuclei* (Hornung, 2003).
- Pleasure, playfulness and satisfaction – endogenous rewards from the *periaqueductal grey* (Blood & Zatorre, 2001).

These various brain regions project neurons out into midbrain and cortex to stimulate activity by changing the neurobiochemical milieu. I propose that these brain regions in the upper brainstem and lower midbrain are collectively the functional structures of curiosity. As a precursor to ongoing research, it is useful to create a collective name, as has been done with the areas such as the limbic and basal ganglia. I suggest the *nuntius nuclei* (Hill & Rossi, 2017). *Nuntius* is Latin for messenger or announcer, which seems fitting for the nuclei and brain regions that produce neurotransmitters that are messengers of the brain.

Conclusion

I suggest that an orientation of curiosity creates changes on many levels including the neurobiology. I further suggest that CFMP practiced in daily life, as a lifestyle, can create a state of mind and brain that is open for learning on many levels and which can be beneficial for all people. Such speculation requires research and verification, but I believe there is enough evidence available now to make these propositions. If we prime our mental state with a sense of interest and wonder; seek out something that is beneath the obvious and superficially apparent; and finally look to create something new, meaningful and self-relevant, we can have a positive effect on personal growth and group interaction and cohesion.

This creates the necessary circumstances for people to freely and comfortably engage in natural social practices. Most importantly, it enables people to engage in their natural inclination to be collaborative and innovative, as human beings have done for millennia, enabling them to be one of the most successful species on the planet.

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