An introduction to NEUROSCIENCE FOR THE PEACEBUILDER

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An Introduction to Neuroscience for the Peacebuilder. Mari Fitzduff

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Section 1: Introduction: Why Neuroscience?

‘For the mind of man is far from the nature of a clear and equal glass, wherein the beams of things should reflect according to their true incidence: nay it is rather like an enchanted glass, full of superstition and importure, if it be not delivered and reduced.’ Francis Bacon Novum Organum (1620)

‘We all want peace – don’t we?’
(Prof. Gareth Fitzgerald, Prime Minister of Republic of Ireland, 1981-1987)

This paper began many years ago in the midst of the conflict in Northern Ireland. I was interested in how one could effect change, particularly in ending the use of violence to achieve social and political ends. I knew that there were some people who had once used bombs or bullets to try to effect change, but who were now instead engaged in dialogue work, rather than violence, to effect their desired changes. I wondered what had brought about the change in their behavior, and if there were lessons to be learned from them for those of us who were interested in peacebuilding. I therefore I chose this focus for my doctoral work. Somewhat to my surprise, I discovered that there were very few people who had been reasoned out of their support for violence – by far the majority were those whose minds and actions had been changed through experiences that had created emotional dissonance for them and their lives. I was also struck by the fact that most of our existing change programs were focused on a belief in the use of argument and reason, both through public debate, and through a belief in the processes of contact to undertake such discussions.

Subsequently, again and again, through my work as an active policy maker and funder of conflict resolution work in the 1990’s, I came to understand how little part reason plays in social conflicts. I met Loyalist/Protestant paramilitaries who believed that the Battle of the Boyne, an icon of Protestant victory that took place in 1690, was enshrined in the Christian Bible. Their ignorance of actual facts was palpable – just like that of the many foreign young men now fighting against the government in Syria, some of whom do not even appear to know where Syria is, or which side they are on, let alone know or understand the issues or the actors in the conflict.

For decades I have continued to wonder at most groups capacity to believe that their violence is justified – and the other sides violence is not. At their ability to inevitably, often somewhat tortuously, find ways to blame others for what had happened – even when it was their bombs that had killed and maimed women, children and bystanders. I have been particularly disconcerted and dismayed at the short - term approaches adopted for political gain by so many of our politicians and governments around the world, despite the fact that many of their strategies almost directly and inevitably lead to communal violence. I have also wondered at the power of fundamentalist ideologies of either a political or religious nature that possess the minds and hearts of people and their groups, often beyond their own life,
as well as that of many others. And I have frequently caught myself cynical about the belief that 'of course everyone wants peace, don’t they?’ as was once said to me by a gentle and intelligent professor prime minister from the Republic of Ireland.

Through pondering such challenges, I have come to believe that the tenets we hold about how to bring an end to conflict often do not add up, nor explain the many seeming irrationalities and inconsistencies that are part and parcel of our wars. Through my work as a social psychologist, I have long been aware of e.g. the effect of horizontal inequalities on a community’s grievances, and the importance of group belonging, chosen traumas and intolerance in shaping our conflict histories. But even such frameworks left many puzzles for me in my understandings about the ubiquity of so many societal conflicts.

It has been through a relatively new science - or parts of other sciences - that I came to see more and more of the confusions I had faced in a different light, and a light that has somewhat helped explain for me so much that had been a puzzle to me in my previous work. These were the processes associated with emerging ideas that question whether or the not the way in which our minds had been physically and hormonally shaped by the exigencies of our development through evolution have left us with some legacies of which many of us are unaware, but which appear to help foment violence. Many of these processes are currently being studied by businesses, governments and others for their possible use in shaping human behavior. These relatively new fields are called variously e.g. neuroscience, neuropolitics, neurobiology, neuropsychology, genopolitics, political physiology, political psychology, behavioral genetics, and cognitive neuroscience. The understandings they suggest about the human brain have been in use for over a decade now by economists, and by businesses such as Google who are (rightly or wrongly) using neuroeconomics and neuromarketing as part of their business strategies.

Such utilization is spreading through other fields. There is now e.g. neurotheology, utilized by those studying the power of theism, and neurolaw, by those wishing to understand the effective possibilities of legal processes. These new fields are about understanding what there may be in the hardware, or software, in the genes or the biology of the mind and the body that affects how we think and behave, and how to use such understanding to e.g. sell goods more effectively, or to ‘nudge’ people into better public behavior. One interesting example of the latter is the UK cabinet office’s behavioral insights team, usually called the ‘Nudge’ unit, which was set up in 2010 to find better ways to look at policy tweaks that would help the quirks of our neural frameworks work better for us - and that would also save public money. While, understandably, some may find the use of such techniques somewhat ethically dubious, they have been used very effectively to increase body organ donations by an extra 100,000 in the UK, by establishing an opt-out scheme, rather than an opt-in scheme, thus demonstrating how such understandings can bring useful benefits to what is a public good.
As yet, in the field of peacebuilding, we have not, in any organized way, begun to try and investigate whether or not some of these new understandings may help us to better address some of the neural forces that we face as human beings in trying to better manage conflicts and wars. These would involve investigating issues of genes and biology, and the study of bio-physical correlates of political attitudes and behavior, that may have effected road blocks and blind spots for many of us, and that appear to make it more difficult for us to end our wars. Perhaps, just perhaps, there may be useful grist for our learning as peacebuilders, and our evaluation of such work, in such investigations, and this paper is an attempt to begin that conversation.

I am aware that in beginning it, I am facing at least three major challenges. The first is that in focusing on such understandings we may turn the spotlight away from structural and societal issues that are unfair, that exclude, and that oppress certain groups, and which make their use of violence understandable, if not justified. Any study of my policy work, and my publications throughout the years in which I have been involved in this work will show that my very first concern is that organizations, nations, regions etc. who oppress or exclude certain groups should urgently address such structural issues, as they are often the abiding backdrop to the causes of many, if not most, of our wars today. Issues of psycho/sociocultural understandings, and any programs that are based upon an understanding of such, will be ineffective in the long term if structural issues are not addressed. I remain committed to that belief, and the research that follows in this paper will in fact underline the reality that structural contexts, for better or worse, often define how we behave to each other as groups of human beings.

The second is the fact that the legacy of scientific racism i.e. the use of scientific techniques and hypotheses to support or justify presumptions of racial inferiority, or racial superiority, is still with us. Many within our various fields were, and still are, rightly horrified about the abuse of genetic and social data that was the legacy of the 19th and 20th centuries, and to a certain extent is still with us today, although rarely openly justified. I am from a group that has suffered for centuries from being portrayed as apes in the popular European and UK press of the 19th and 20th centuries. A cartoon published in Life Magazine on May 11th, 1893 depicts the apes in the zoo who are sad that they get called by Irish names - which they feel is to their detriment! However, none of the research that follows will give any sway or ballast to anyone interested in eliciting such differences for reasons of discrimination. Alas, the contrary is true – we are all of us indicted for the instincts and the confusion that we often bring to bear upon the situations in which we work, and strive to build peace.

The third challenge is one that I concede is very valid indeed, and it is one that almost prevented me from writing this paper. The fact is that much of the research that I write about in this paper is very tentative. The advantages of neuroscience have been much touted for its ability to look under the hood of our brains, and perhaps to help us to see some of the mechanisms and processes that can help to create and perpetuate conflict. However the reality is that many of the
mechanisms used to measure such thoughts and behavior, such as fMRI neuroimaging, are still in their infancy. There are many who will contest the explanatory power of processes like brain scans, and hormonal measuring, and who suggest that what we can learn from current research in neuroscience has been vastly overestimated. Some researchers are concerned that the general public has been seduced into believing that any study, research article, or news report, accompanied by a brain image or two, is reliable and scientific, not withstanding the tentative nature of the research. In fairness, I have often found that the researchers themselves often acknowledge the tentative nature of their findings.

Whole articles, and even books, have been written about many of the issues mentioned in the paper. I have included many of these sources at the end of the paper so that people can follow up and make their own judgments about what I, no doubt coming from my own biases, have chosen to pinpoint as possibly useful for our work. And so new is the field that much of what is contained within the paper will inevitably change as the research continues to multiply. As Wikipedia would say ‘This article has multiple issues - please help improve it!’

We also need to remember that most of the research outlined in this paper has been conducted by and on what are called WEIRD people i.e. Western, Educated, Industrialized, Rich and Democratic, although some researchers have ventured into comparative waters. Such limitation in terms of constituencies studied brings its own biases.

Despite such reservations, I believe that while there may be little consensus as yet on many of the details of the research, what is not contentious is that there is an increasing recognition of an interdependence between the genetic and physical aspects of our social and political behavior that should perhaps be taken into account alongside the social and environmental factors that influence us throughout the course of our lives.

A few caveats. I have tried to bring to bear a non-judgmental approach to the differences that appear to be evident between human beings and e.g. their neural architectures. As the research shows, people and groups are different in the way they think, process information, the kinds of emotions they bring to bear upon decisions, the control they have over their emotions, the needs they have to belong to a group, what they prioritize as values, the importance of ideology in their lives, the way they identify enemies, the way they see facts, what they remember and forget, their fear and suspicions of out groups, their need for leaders, etc. These differences are neither good, nor bad. They just are – and they exist possibly because somewhere along the line such differences, and a mix of such differences, have been important for individual and group survival. What is important I believe is that we understand these differences and take them into account in our work.

As noted before, in attempting to understand these various neurological and biological differences, and their effects on individual and group behavior, I am not suggesting that our task should be to end wars by focusing on e.g. drugs that can change the dispositions of groups (although I confess I have sometimes been
tempted to suggest such – valium in some water systems has come into my mind occasionally!) or the development of physical processes that can manipulate our brains in some fashion. What is important to remember is that wars start not because of such differences, but because such differences come into play through manipulation and violence within a situation where people feel unequal and excluded. Most of our recent and current wars have come about because of issues of inequality or exclusion e.g. Syria, Iraq, Sri Lanka, Philippines, Vietnam, Ukraine, Kenya, etc. If such contexts had been handled differently, the individual and group differences noted in the research might just be part of the normal grist of a society that is blessed with different characters and approaches to the social issues that are the rule in most peaceful societies.

Finally, and most importantly, there is nothing determinist about what is revealed by the research in this paper. Brains can be relatively plastic in their nature. They can change both their hardware and software, even though this can be difficult and take much time, depending on what has already been established biologically and environmentally in terms of what are often unconscious tendencies. The memory parts of the brains of both taxi drivers, and of waitresses have been shown to grow bigger because of the increased activity necessitated by their work focus. Buddhist monks who do compassion meditation have been shown to modulate their amygdala, the part of the brain that is involved with the experiencing of emotions, during their practice. It has also been suggested that increased activity in the amygdala following compassion-oriented meditation may contribute to social connectedness. And evidence of increased empathy in our mirror neurons has been shown to be possible to achieve by dialogue processes between opposing sides in a conflict.

What such plasticity suggests is that while we are, both as individuals and groups, often predisposed to respond to conflicts in certain ways that are more sympathetic to our genetic and biological make-up, as well as our social and environmental history, we are not trapped by such characteristics. *Predisposition does not mean predetermination* – there is no individual or group that cannot change its behavior towards another individual or group. But there are many situations where more effective strategies for peacebuilding will need theories of change based on a more thorough understanding of the study of bio-physical correlates of social and political attitudes, and the attendant behavior involved in such correlates. How can, and how should we use such insights in helping us to better effect our work? Our attention to such may help us achieve more thoughtful approaches than hitherto to our work as peacebuilders, given the understandings that are being revealed to us by the nascent field of neuroscience.
Section 2: The Rider and the Elephant: Who is in charge in our minds?

In our heads we have a rational charioteer who has to rein in an unruly horse that "barely yields to horsewhip and goad combined." Plato.

Who is in charge of our minds? 'Us' of course we will say – but which us? Our brains have many activity centers which have different functions and are connected by chemical impulses. These impulses transfer information through the cells in these brain regions, sometimes at a speed of 250 miles per second. There appear to be two regions of the brain that are important for peacebuilders to know about, and how they function. These are the parts that process our automatic/intuitive impulses and the part that deals with our conscious/reasoned processes.

The first is the size of an almond and called the amygdala the part of our brain that deals with our senses, with our memories, and with our emotions such as pleasure or fear. Its processes are automatic, sometimes called intuitive or implicit processes, and are impulsive or instinctive in nature which means that we have little choice about feeling them. This part of our brain is often called the old, or "lizard" brain. It is the deepest part of the brain and is reckoned to be at least 60-200 million years old. It records memories of behaviors, which have produced feelings of good or bad experiences in our lifetime, and in those of our ancestors, and is responsible for our emotions. It exerts a very strong influence on our choices, often at an unconscious level. Those of us who have bad tempers, or difficulty in restraining our eating, or other appetites, can understand its power.

Another important section of the brain, is the prefrontal cortex which concerns itself with conscious/rational processes, and is the part that contributes to more analytic, logical and thoughtful responses to a situation. It is considered to be the 'new' brain and is deemed responsible for the development of human language, for abstract thought, for our imaginations, for reasoning, and our consciousness. The amygdala conveys our feelings to the frontal cortex, the brain region that controls thinking and planning, and such feelings then affect our rational processes.

These ‘emotional’ and ‘reasoning’ minds coexist uneasily. This challenge has been well captured by Haidt in his analogy of the Elephant and the Rider, where our emotional side is the Elephant and our rational, reasonable side is the Rider. The Rider is perched atop the Elephant, and seems to be the leader, but her/his control is precarious because the Rider is so small and so new relative to the much older and deeper Elephant. Anytime the Elephant and the Rider disagree about which direction to go, the amygdala/Elephant part of our brain is likely to win, unless we are able to bring our Prefrontal Cortex/Reasoning to bear strongly upon our decisions.

The amygdala is particularly likely to come to the fore if we are under stress which then makes it more likely for our emotions to bypass our thinking cortex and to return to thinking and acting according to the “older” brain drives. The
predominance of intuitive/emotive thinking versus cognitive reasoning, or ‘fast versus slow thinking’ as it has been termed recently, is particularly evident and automatic in situations where fear is a factor, which is an emotion that is very present in many of the contexts we deal with as peacebuilders. Such amygdala feelings come not only from current situations, but in many cases have been generated and fostered by many decades of conflict, and are often the product of many generations histories of emotions.

We are all of us, no matter how well educated, subject to the strength of such emotions. Those of us who have ever been in riot situations have noted how quickly such emotions come to the fore, and they are palpably in evidence in situations of genocide. Following such violence, people often wonder at themselves and at the atrocities they may have committed, and are confused because they did not believe that such behavior was part of their character. Following the Summer 2011 riots in Britain, it was evident in the court appearances that followed that many young, middle class teenagers, who would normally eschew such riotous behaviors, found themselves actively caught in perpetrating street violence. Many of them looking back say they saw the riots as ‘some form of midsummer madness, a kind of bad dream’, and completely out of their ‘real’ character.

Unfortunately, many of us fail to understand how precarious is the conscious/rational side of our brains, until we find ourselves in a context that unleashes the forces of our amygdala. In situations of conflict and violence, and often preceding such, where our families, communities and our people feel under stress, fear and group processes often overtake our emotions. These emotions can be extremely hard to control, particularly at group level. It has been suggested by Greene that the human brain is like a dual mode camera with both automatic settings and a manual mode, which is the brains trade off between efficiency and flexibility i.e. the automatic settings for emotions are efficient but inflexible, and the manual mode is reasoning, which can be shaped by emotion, but not necessarily dictated to by it unless we can bring sufficient force to bear upon it by our conscious rational selves.

The upshot of such precariousness between fear, emotion, and reasoning is that for change to happen, we need to be both emotionally and rationally engaged. It is not enough for people to intellectually understand that they should take actions that can end a conflict. Many of us have filing cases full of possible ‘rational’ approaches to all of the conflicts in which we are working. However, for people to actually approach that filing cabinet, and its possible solutions, they also need to be emotionally motivated to do so, which is often a harder process to manufacture than any reasoning in favor of particular solutions.

In basing our work on rational/logical thinking, we often fail to understand how little actual sway such thinking has on the actors concerned, and on their constituencies in the field. Time and again we see groups continue fighting beyond much apparent reasonable gain for all involved. Peace agreements fall apart because,
although the cognitive skills of those involved have crafted clever political and social compromises, the necessary attendant emotions often destroy the agreements when they return to their land or their people. And when crises arise in the implementation of such agreements, the emotions attendant upon such crises often return leaders and their constituencies back to the emotions that have helped to kindle the violence in the first place. Hence the number of peace agreements that fall apart.

An attendant problem is that most of the research on conflict is undertaken by academics many of whom who often fail to appreciate the strength of the amygdala factor. Many of them still function within a traditional international ‘realist’ politics framework, which deals with so called ‘rational’ actors, and ‘rational’ states, and they fail to appreciate, or have the vocabulary, to deal with the emotional factors, which is probably the dominant factor in what is happening in most of our conflicts today.

Section : 3 Vive La Difference: How Brains differ

“I often think it's comical / How Nature always does contrive /That every boy and every gal / That's born into the world alive / Is either a little Liberal / Or else a little Conservative!” (W.S. Gilbert ditty 1882)

People have genetically varying brain structures. Some people show an increased gray matter volume in the amygdala, the structure in the temporal lobes that performs a primary role in the processing and memory of emotions. Others show an increased gray matter volume in the anterior cingulate cortex, the structure of the brain associated with rational/logical thinking, with monitoring uncertainty and with handling conflicting information. Functional magnetic resonance imaging or functional MRI(fMRI) is a technology that measures brain activity by detecting associated changes in blood flow. fMRI scans have shown that these differences in biology, and in genetics, influence differences in attitudes and beliefs. At one end of the spectrum, people, usually called traditionalists or conservatives in the literature, more often use their right amygdala, the part of the brain associated with the body’s fight-or-flight system, when making decisions. They appear to have genetically greater sensitivity to fear and uncertainty, and these differences can be observed from birth. They respond much more quickly to sudden noises and threatening visual images.

The degree to which individuals are physiologically responsive to such threats appears to indicate the degree to which they advocate policies that protect the existing social structure from both external out groups and internal, norm-violator threats. Fearful people tend to be more conservative. They have a greater need for order, structure, and certainty in their lives, resist change more often, and are less open to risk taking. Researchers have shown that they are usually more
supportive of policies that provide them with a sense of security: hence their greater backing for e.g. military spending, capital punishment, patriotism, and tougher laws on immigration.

Such people also report greater physiological levels of disgust when faced with bugs, or blood, and in relation to such issues as gay marriage and abortion. They value ‘purity’ and order and are known to devote high levels of attention to norm violations. An example of this might be the suggestion by some historians that the development of the Taliban originally emerged out of the disgust felt by former pious mujahedeen living in Pakistan at the lives of their fellow colleagues whom they saw as socially and morally corrupt and impure. Thus was born the commitment of the Taliban, and subsequently the ISIS-Islamic State, to establishing a ‘pure’ Islamic state, with no compromises, through the use of Sharia Law. While the predisposition to experience greater fear has a genetic component, what exactly people will fear, or towards which out group they will harbor suspicions, will differ depending on their environment, their culture, and their social contexts.

On the other end of a continuum, there appear to be people who are genetically more open to new things, and to new experiences - these are often termed ‘liberals’. fMRI scans have shown that they can better tolerate uncertainty, and cognitive complexity, take risks more often, and have wider and more diverse friendships. They tend to show greater activity in the left insula of their brain, which is an area that appears to be associated with self and social awareness. They often exhibit stronger preferences for social change and equality when compared with traditionalists. When faced with a conflict, liberals are more likely than conservatives to be more flexible and to alter their habitual response when cues indicate it is necessary. Researchers have also identified a variant called DRD4-7R, which affects the neurotransmitter called dopamine, and individuals carrying it are more likely to turn out to be liberals.

There is speculation in the literature that evolutionary wise it may have proved useful to have such varied types of individuals in a society so as to ensure the best survival responses to different sets of societal and group challenges. Interestingly, people whose amygdalae have been completely destroyed appear to feel that everyone is ‘my kind’, and they feel no threats from out-groups. Such lack of feelings would obviously, throughout history, leave them open to possible manipulation, abuse and extinction. It has also been suggested that conservatism has been the majority norm throughout history, and that the growth in liberalism may be viewed as an evolutionary luxury that is increasingly afforded only by the fact that many societies are becoming less deadly today.

For some researchers, this division of differences into traditionalist/liberal dimensions in not multi-dimensional enough, and in their fMRI studies they have identified three different patterns of brain activation that they believe correlate with individualism, conservatism, and radicalism. They have used multidimensional scaling and parametric functional magnetic resonance imaging to identify which
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criteria/dimensions people use to structure complex political beliefs and which brain regions are concurrently activated. They found that three independent dimensions explained the variability of a set of statements expressing political/social beliefs and that each dimension was reflected in a distinctive pattern of neural activation: individualism in the medial prefrontal cortex and in the temporoparietal junction of the brain, conservatism in the dorsolateral prefrontal and radicalism in the ventral striatum and posterior cingulate areas. The structures they identified are also known to be important in ‘self-other’ processing and social decision-making in ambivalent situations.

Twin studies seem to bear out the contention that social and political perspectives are genetically shaped. A review of over 89 peer-reviewed papers on the effects of genes and environment (both family upbringing and their wider context and circumstances) on twins’ attitudes to racial, sexual and religious questions, their views on defense and foreign policy, and their identification with particular political parties showed a direct correlation between genetics and social views, although not a correlation with a political affiliation. A 2005 U.S. twin study examined the attitudes of identical twins regarding 28 different social and political issues such as capitalism, trade unions, X-rated movies, abortion, school prayer, divorce, property taxes, and the draft. They compared them to non-identical twins, and estimated that genetic factors accounted for 53% of the variance of an overall score, and on all counts, identical twins were found to be more alike in their views than fraternal twins.

The findings of differing kinds of neural architecture would appear to be comparative. Systematic differences have been noted across populations. Tolerances for group differences vary: those in Scandinavia and Northern Europe demonstrated the most tolerance for out-groups, and this may help explain their (current) more liberal social policies towards immigration.

However, it is important to remember, as noted before, that people are predisposed but not predestined to become ‘conservatives’ or ‘liberals.’ While there are no actual genes for prejudice or tolerance, a person’s genes can predispose them to adopt a more cautious, or a more liberal response. How much our genetics influence our attitudes and behavior is still a major research question. The suggestions range from 40% to 53%. While it is suggested that predispositions can be changed, and altered, effecting such change has been likened to turning a supertanker – such change takes considerable effort and time.

Critical also to note is the fact that certain environments such as post 9/11 may be so powerful that they elicit a common response in humans that leaves little room for genetic differences to manifest. A study of survivors who were highly impacted by 9/11 attack on the New York World Trade center found that three times as many survivors reported becoming more politically conservative in the 18 months following the attack, regardless of partisan identification and prior voting patterns.
Some researchers assert that determining social/political tendencies from fMRI data is overreaching its capacity. There are also others who suggest that such categorizations have a long history that extends way before the invention of magnetic resonance imaging and hormonal testing. They point out that Thomas Jefferson can be noted as one of the first ‘neuro-politicians’, and indeed one who was open about his own preferred bias. The president was convinced that the hardened Federalists he opposed were suffering from damaged brains, and diseased minds, which rendered them incapable of supporting healthy social growth. He suggested that they were “nervous persons, whose languid [nerve] fibres have more analogy with a passive than active state of things.’

Jefferson of course did not have the advantage of fMRI scans capable of confirming or otherwise his viewpoint. But the fact that there are now fMRI scanners that can test, describe and predict how we will think and feel about an issue or an out-group must give us pause for our peacebuilding work, and how we can make our work more effective.

Section 4: Us and Them: Who is my Neighbor in today’s world?

‘Biologically humans have evolved for cooperation - but only with some people’ (Greene, 2014)

The change in oxytocin after a social interaction as measured in a person’s blood reflects changes in oxytocin in the brain. If it is present in abundance, it can make you demonstrably more generous, trusting and compassionate towards your neighbors, or otherwise. Experiments have shown that bonding within groups is assisted by a hormone called oxytocin, a rise in the level of which appears to provide a ‘glue’ between people. This hormone increases a sense of belonging, and of connectedness to a group, and positively rewards cooperation e.g. spraying Oxytocin into people’s noses makes people more likely to cooperate in a version of the conflict resolution game called the Prisoners Dilemma.

Oxytocin reduces the fear of social betrayal in humans and is important for the inhibition of the brain regions such as the amygdala, which as we have seen are associated with stress, fear, and anxiety. The genetic basis for oxytocin production and receptivity has been identified, and there are indications that their levels may be inherited. They also may have had an evolutionary function. High levels of oxytocin may have enabled some groups to thrive better than others as they have been found to correlate with different levels of cooperation, and to correlate with different social decisions.

However, research has also indicated that while oxytocin can increase levels of cooperation within a group, it can also promote ethnocentric behavior. It can increase our suspicion and rejection of ‘others’ outside the group or the tribe, and it
makes people less likely to cooperate with members of an out-group. This has lead to the suggestion that biologically humans have evolved for cooperation but only with some people, and not with others, and for some researchers to suggest our brains are wired for tribalism. There are also findings that suggest that out group biases such as race bias may be a fear “prepared” by evolution and not purely contextual, as elements of the amygdala appear to be responsible for, and associated with, implicit, as opposed to explicit, attitudes towards racial out-groups.

Our attitude towards out-groups is also affected by what scientists call ‘mirror neurons’. Brain imaging experiments using functional magnetic resonance imaging (fMRI) have shown that the human inferior frontal cortex and superior parietal lobe are active when the person both performs an action, and also sees another individual performing an action. It has been suggested that these brain regions contain mirror neurons, and they have been defined as the human ‘mirror neuron’ system. These particular neurons in the brain appear to be linked to our capacity for empathy, the emotion which enables us to better understand other peoples intentions, feelings and emotions and allow us to see the world from another’s point of view.

Before the discovery of mirror neurons, scientists generally believed that it was through the use of our brains and cognitive thought processes that we interpreted and predicted other people’s behavior. Now, however, many have come to believe that we actually understand others not by thinking, but by feeling through the ‘mirror’ neurons in the affective brain circuits. These circuits are automatically mobilized when we feel our own pain, and also feel the pain of (some) others, and they are the part of the neural circuitry that provides our emotional response to the distress of other people. This ability to empathetically perceive and respond to the affective states of another emerges as early as two years of age. The existence of empathy is a universally hard-wired response, although its expression varies according to cultural contexts. Of interest to note is that the part of the brain that controls empathy appears to be bigger in women, who show enhanced empathetic ability when compared to males. It is suggested that empathetic responses may have served an adaptive evolutionary function.

Researchers have however noted that empathy is less commonly exhibited by adult individuals toward people from differing out groups. When the context is one of perceived conflict, the brain appears to switch off the empathetic neuron almost completely and actively resists any emotional connection with the perceived ‘other’ group. Sociological studies have already shown that high levels of integration or ‘bonding’ within a group seems to reduce a group’s capacity to develop ‘bridging’ and cooperation, between differing identity groups, and this is confirmed by the research on mirror neurons.

The power of contact and dialogue in increasing empathy and connections has been examined using fMRI imaging, which appears to be successful in estimating such changes. Encouraging perspective shifting i.e. changing the way people understand and think about other groups through meeting and talking can, if done
effectively, actually alter the neural circuits concerned with identity differences. fMRI can also provide a way of evaluating such changes.

In recent years, the Project on Justice in Times of Transition (now renamed Beyond Conflict) has been working with the MIT Saxe Lab on investigating the power of dialogue to change perspectives about out groups. While dialogue appears to have positive effects, such effects are highly influenced by the social and political perspectives of groups in relation to each other’s perceived status. Positive empathy towards opposing groups improved most among members of the disempowered groups, such as Palestinians and Mexicans, who told their own stories, and were listened to by the group that they perceived to be more powerful. On the other hand, groups that were perceived to be dominant groups, such as the Israelis and the US Americans, increased their empathy by listening to the stories of the groups who perceived themselves to be excluded or oppressed. It seems that the form of dialogue most effective in soliciting empathy differed according to the perceived power asymmetries between the groups. These findings illustrate the need to address, or promise to address, structural societal differences as a complement to achieving the perceived purpose of effective dialogue strategies. If these changes in empathy can be sustained beyond just temporary contact opportunities, and can be carried back into society by significant actors in the conflict, they may provide the field with very useful data about how best to arrange for dialogues aimed at achieving continuing empathy and synergy between opposing groups.

Why do our brains exhibit such differing hormonal and neural responses to our own and to other groups? There is a very lively debate between researchers as to whether the evolution of behavior happened at the level of the group or the individual, and whether and when the individual gene for survival will predominate over group needs. While the theory for the success of individual gene – the so-called Selfish Gene theory - has been well addressed, the suggestion of the genetic nature of cooperation and altruism, and subsequent success at group level is a relatively new thesis. The last decade has seen a contemporary burgeoning of literature and debate about the topic. A robust case is now being made for the idea that group survival, as well as individual survival, is an equally powerful genetic factor in human beings. This theory suggests that such group drive, which goes beyond kinship, is critical for humans to live in groups, to raise families, to cooperate to build villages and cities, and to defend themselves and their territories against threats to their group.

Without doubt, the apparently selective nature of group survival has been a keen factor in societal conflicts and wars. The categorization of out-groups into enemies or friends, part of our group or not part of our group, is a universal trait that takes place in all societies and nations. Such framing of the enemy will obviously differ and change from context to context, but has ever been part of our history, as have been the changes in such categorizations. People from Ireland and Italy were not considered ‘white’ by most 19th century Americans, and it took a US court to decide in 1909 that Armenians were part of the ‘white’ race. The
categorization of African American, Latinos and Native Americans as societal 'others' continues in many contexts in the United States. Even the apparently smallest of differences such as those between Sunni or Shia, or Catholic or Protestant, or French or English speakers can provide a framework for violent and often deadly conflict.

Such racial, religious, ethnic and language categorizations at community, regional, national and international level are the grist for the mill of most of our wars around the world today, and are easily utilised by leaders for their own gain. They appear to be assisted in this by our network of interacting neural circuitry, and the hormones that are responsible for the emotions with which we address out-group categorization. Such categorizations often work outside of our awareness, but often have deadly consequences. It enables our group to mobilize itself to kill another group when the context appears to call for group solidarity in the face of suspicion and fear.

While religion and ideologies often bind a group together they are not necessary to the development of group boundaries. Almost any form of group relationships, such as gangs, cults or paramilitarism can suffice. This is particularly true for young men, where killing of others can provide for a feeling of cooperation in a larger cause than themselves, and a way to gain esteem in the eyes of their peers. Many psychological experiments have already proven how contextually dependent are our decisions within group contexts which can radically alter our 'normal' pattern of behavior, usually in favor of group pressures. Groups can and do become our energizer of ideas and actions, often beyond individual reasoning. In Section 5 we will see how we also appear to be programmed to excuse our own group, and blame others, to see the faults of others clearly, but be blind to our own.

In addition, our devotion to leaders may have developed to facilitate cooperation in large groups. Our leaders are often chosen because of emotional choices. A lot of this appears to be part of our evolutionary history. Being social animals, we are perhaps 'programmed' to try to lead, and to be led. We usually choose our leaders because of our gut instincts, not after a thorough analysis of their characters or strategies. We often prefer our leaders to speak with certainty about issues we are concerned about – often irrespective of the substance of their arguments. Leaders who express hesitation, or even endorse the value of consultation, can be anathema to us. Our need is for them to be clear and strong, particularly if we are afraid. This may have been the result of our evolutionary history. We appear to be programmed to be led and to have faith in hierarchies, because of our desire to be conform and be protected. This followership can lead us into excluding others, and carrying out violent atrocities. The obedience studies of Stanley Milgram illustrate this tendency to "blindly" carry out the orders of an authority, even when it means painfully shocking and potentially harming an innocent victim. Once people have adopted a leader, even new negative information about that leader can often lead them to intensify rather than lessen their support for him/her (mostly him). Obedience studies show how easy it is for us to do harm to others either by being ordered to, or by taking on the roles of e.g. prison guards,
and then adopting practices that appear to be contrary to what we understand is our normal behavior.

Once again, it is important to remember that such tendencies can be mitigated. One of the most important conclusions from neuroscience research is that the human brain, throughout life, is predisposed to be physically molded, in ongoing ways, by human interactions in contexts that provide for social learning, and the rewiring of neural pathways. As we have seen throughout history, our definition of which out-groups are our enemies is socially learned, and also that such enemies can and do change. People living in more market-integrated societies tend to be more altruistic and tolerant to strangers, and more adept at cooperating with them. This suggests that although our brains are wired for tribalism they can be (eventually?) re wired to include wider groups through experience, and contexts and institutions that facilitate tolerance. Whether we can totally eradicate this tendency appears doubtful. It is commonplace for peacebuilders to wish for an overarching enemy, perhaps outside of our earthly context, to provide a ‘safe’ target against which humans can unite and forget their differences, and this hope is a logical one, based on an accurate perception of human nature. It accords with an understanding of the nature of human groups and the wars between them, and the usefulness of a common enemy around which to rally groups emotions.

There have been many experiments in testing whether and how one can increase a surge in oxytocin in our brains, as an ability to ensure such may have some utility for the field in enhancing trust between group. Such an increase might help in managing difficult encounters and conversations between erstwhile and current enemies. Indeed many of the stories of peacebuilders about how peace agreements were eventually reached often point to informal, and often unrecognized, personal and group processes that appear to have been successful in increasing oxytocin and trust levels. These included factors such as gift giving, meal sharing, alcohol, where such was culturally permitted (just a modicum – too much can make us more belligerent!) empathetic responses to ‘others’ family crises, positive physical gestures, expressions of understanding and appreciation, physical manifestations of listening, sharing of family stories, group singing, etc. Note that none, or almost none of these are mentioned in the mediator’s guidebooks, but fMRI and hormonal testing indicate that perhaps they should be.
Section 5: The Believing Brain: How we fool ourselves and others.

‘The first principle is that you must not fool yourself - and you are the easiest person to fool’ Feynman (1974)

‘Our moral thinking is much more like a politician seeking votes that a scientist searching for truth’ Haidt (2012)

Why do we believe what we believe? Because it is true? Rarely, it appears. Our beliefs in many cases appear to be determined not by ‘truth’ but by our own physical tendencies, our needs for beliefs, or moral values and the cultural context in which we live. In other words, beliefs often come first from our physical characteristics, and then our social environment i.e. we mainly rationalize what our guts (and fears) tell us.

Experiments have shown the interdependence of genetic, social and environmental factors in the development of our beliefs and moralities. Researchers have used genome-wide linkage analysis i.e. an examination of the many common genetic variants in different individuals, in order to identify chromosomal regions associated with social and political attitudes along the ‘liberalism/conservatism’ scale. In 2010 a study implicated a gene known as DRD4 in the development of general social/political orientation. The DRD4 gene encodes a receptor molecule for a neuro-transmitter called dopamine. Those with a variant of DRD4 called 7R, and also a large network of acquired friends, tended to be more liberal.

The research suggests that the development of a liberal disposition requires both a genetic input (the 7R variant) and an environmental one (the network of friends) to take effect. DRD4-7R had previously been associated with novelty-seeking behavior, and the researchers speculated that the interaction of that tendency, with its attendant exposure to lots of different ideas held by lots of different people might push an individual in a liberal direction. Later research has found a further 11 genes, different varieties of which might be responsible for inclining people towards liberal or conservative beliefs. These included genes involved in the regulation of three neurotransmitters—dopamine, glutamate and serotonin—and also G-protein-coupled receptors, which react to a wide variety of stimulants. Many other studies have shown that biology and psychology are inextricably linked. This means that when our physical biology is altered, this can lead to changes in personality tastes, preferences, perceptions, attention, emotions, attitudes and behaviors.

While we appear to have automatic settings for our beliefs that are based on a combination of our neurological architecture and our social context, the substance of what we believe as individuals is right or is wrong is not usually something we learn for ourselves. We inherit the majority of our beliefs, perhaps as a legacy of what helped our ancestors survive. As we have seen in Section 4, our views as part
of a group are rarely based on cognitive processing – they are often a case of group think, i.e. views that are based on group needs, rather than based on fact checking. They are what Haidt calls ‘groupish’ which means that we usually approve of what we think, or are told is good for our group. While our group beliefs often successfully serve what is seen as an evolutionary need to bind us more closely to each other, and thus ensure our group survival, they often unfortunately blind us to the points of view of other groups. In Haidt’s term, morality "binds and blinds" i.e. it binds us to the group and blinds us to the point of view of outsiders.

Once group beliefs are sacrosanct, the members of a group often lose their ability (and their freedom) to think rationally about them. This is helped by the fact that, once our views have been formed, we have a tendency to see and find evidence in support of already existing beliefs, and ignore evidence that challenges them. fMRI studies have shown that, when faced with logical contradictions to their deeply held beliefs, people often feel negative emotions, but there is no increase in the dorsolateral cortex, the part of their brain which is used for reasoning. Most of us do all that we can to protect our group beliefs by watching media sources such as Fox News, or certain programs on MSNBC, or by reading the New York Times or the Washington Times, or the London Times or Guardian, Haaretz or Jerusalem Post, etc. often to solidify what we believe. Of course, most of us may be unaware of such biased choices, and refuse to acknowledge this. Conflicting groups watching the same media coverage of their differences all think it biased against them. And when asked to choose between accepting the views of an expert (such as one on global warming) and being a good member of a tribe, the latter is often more important.

Research seems to suggest that while more highly educated people are more supportive of out groups, people with high IQs are not necessarily better at understanding the other side in a moral dispute. They are however better at making the case for what they believe.

It appears that collective ideological beliefs, whether religious, cultural or social, serve to strengthen group bonds, which possibly helped groups to win the societal competition for group level survival. The function of such beliefs often appears to be more important than their content, and the substance of our beliefs are often less important than with whom we share those beliefs. Those of us who have tried to have theological, moral or social discussions with religious or social fundamentalists have usually found how unsuccessful such an exchange process can be. It seems that the religious or political beliefs are more often about a sense of solidarity and collectiveness, than about truth. Such group beliefs are seen by some researchers as more akin to ‘team sports’ than to a form of ‘truth’. This can help us understand young loyalist militants in Northern Ireland who believe that the 1690 battle, which their tribe won, can be found recorded in the bible. Or the many young men fighting with the opposition in Syria, or currently with the Islamic State who often have little idea of the main players in the war, but have blind adherence to their team peers, and their team cause.
Once adopted, our opinions become intertwined with our self or group image, and we avoid situations that may challenge our deeply-held beliefs. Reasoning is therefore often carried out to serve the purpose of persuasion, not of discussion. For many people moral reasoning is usually generated only after a belief has been assumed instinctively. We often lie even to ourselves because it appears that self-deception is an assistive process that enables us to more convincingly deceive others. We usually suffer from attribution bias i.e. the tendency to attribute different causes and justifications for our own beliefs and actions than that of others. When bad things happen, it is always their fault, not ours, their violence is terrorism, ours is justified by security needs.

Our memories too are also notoriously faulty – they often reframe and edit events so as to create a story that will fit our current situation, conflating the past and present to suggest a story to us that suits our what we need to believe today.

Confirmation bias, i.e. the adjustment of our thinking to fit what we want to believe, appears to be an essential part of an evolutionary adaptation as a built in feature, and may not easily be removed.

Religion remains the world’s most dominant group belief (84% of the worlds population belongs to some form of organized religion) and it can be a very powerful motivator for individual and collective violent action. Almost all forms of religion – Christianity, Buddhism, Islam, Hinduism, Judaism, have served throughout history, and many still do today, to provide frameworks of belief that justify exclusion and violence. It appears that almost any ideological framework can be used to serve as a binding group factor.

Political neuroscience researchers, who specifically investigate the relationship between the brain and politics, have suggested that trying to understand the persistence and passion of religion by studying or arguing about beliefs about God is the equivalent of trying to understand the persistence and passion of football supporters by studying the movement of the football. From this perspective, ideologies are not systems of truth, but essentially a group adaptation. They are usually born out of a particular social context, allied to physiological needs such as a differing neural sensitivity to threats, a greater need for the security of identity, and the greater certainty of belief that a group can provide. It is also important to note it is not just religion that can engender collective support for violence. The single most prolific group of suicide attackers in the world has actually been the Tamil Tigers of Sri Lanka, which is a secular movement of national liberation, with only nominal religious affiliation. Communism, an ultra secular form of social ideology, has been responsible for many more millions of deaths than religion during the early part of the 20th century.

Our biology also appears to affect our prioritization of our social and moral beliefs, and such differences can evoke both group solidarity and significant out group misunderstanding or hatred. For some people, such as those on the more ‘liberal’ side, care for others, and fairness to others, are priority values, and they
often see the need to have them incorporated into a governments social structures. For others, whose brains tend more strongly towards values such as loyalty, sanctity, authority and liberty, these values matter more the ‘fairness’ and ‘caring’ exemplified by ‘big government’, and they prefer to undertake their caring through personal and group charity to which they donate more often than liberals. Such findings have been used to explain why working class and rural voters often appear to vote for their values, rather than their economic interests. They have also been the source of many political and social differences in the USA and the UK about the role of governments. Such differences in the prioritization of social values can also be seen cross culturally, and across nations.

While systems of belief, and the shared nature of values, can foster great courage and group altruism, it seems that such altruism is often of a parochial nature, and associated with a particular ideological or territorial group, rather than a global one. How such group altruism can fare in the increasing diversity of all our societies, and within an increasingly globalized world is a major question for the peacebuilders of today.

**Conclusion:**

My hope is that a greater appreciation about how our genetic and physical predispositions, allied to environmental factors, can affect our human behavior, can strengthen our consideration of what we can learn from the emerging field of neuroscience. Such learning, if used wisely, may help us to develop more effective strategies for peacebuilding that can build on our greater understanding of the realities of human nature, and its neural legacies, rather than ignoring them. It may help us, and the groups we work with to understand better, and relate more empathetically, more realistically, and more compassionately to conflicted groups who behave as they do at such significant cost to themselves and others. Hopefully this will help us to craft more effective peacebuilding strategies for the many challenges ahead of us in the decades to come.

(And - If we find such reflections as are noted in this paper distasteful in any way, can we say why, and have a discussion about it?)
Section 6: Questions for the Peacebuilder:

1. How comfortable are we at accepting the limitations of a ‘rational’ approach to peacebuilding? What are the consequences for our work of acknowledging the primary importance of feelings in conflict contexts?
2. If people have brains that are predisposed differently towards outgroups and new ideas, how do we develop strategies that take account of this in our work?
3. How do we work with groups who are passionately committed to only their own group vision of faith or social ideology? How can we increase more constructive group memberships that increase individual and group feelings of positive meaning, safety, and inclusion towards ‘other’ communities?
4. How do we avoid getting caught up in arguments about the ‘truth’ or ‘facts’ as believed by particular groups? How can we better understand and respond to what is often behind such arguments?
5. How can we ‘nudge’ our societies into their best inclusive behaviors? What kinds of local and international societal policies and institutions can we implement that can decrease our tendencies towards fear of the ‘other’?
6. What kind of peace agreements can best deliver on feelings of equity and inclusion, as well as ensuring the quantifiable reality of such agreements on issues of land, rights participation, etc?
7. How do we change our peacebuilding work so that our strategies can take account of the frailty of our inherited human nature that tends towards fear and exclusion of others - as well as our human capacities for cooperation, altruism and courage?
8. How can help to create/choose/assist leaders who foster community and structural inclusion rather than divisions? How can we increase the power of such leaders with their constituents?
9. How would we describe our own predispositions along a conservative/liberal continuum? Do we have moral feelings of superiority about our particular end (or middle) of the continuum? Do we appreciate the need for society to have people who are both ‘traditional/conservative’ and ‘liberal’ despite our own particular predisposition?
10. How can we pitch/target our messages and campaigns to different audiences in full awareness of their differing neural dispositions? How do we frame messages about our work so that they appeal to the whole brain, and not just the rational part of it?
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