

Bond University

Dispute Resolution Review

Volume 1

Issue 1

2020

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A BIOPSYCHOSOCIAL MODEL – THE NEW APPROACH TO DISPUTE RESOLUTION AND CONFLICT ANALYSIS FOR MEDIATORS

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Abstract

In the last two decades, mediation has gained wide popularity as an Alternative Dispute Resolution ('ADR') process. In this study, we will provide insights into the underlying biological concepts of ADR and their application into practical mediation.

Interestingly, a successful conflict resolution process takes place on different levels. We will therefore attempt to explore the influence of these structural levels on ADR and mediation. This influence ranges from the atomic, molecular and cellular to cultural, societal and ultimately biospherical levels. Such a holistic evaluation and appreciation of the foundations of conflict, decision-making, communication, interpersonal relations and behaviour can prove useful in the armamentarium of a competent mediation practitioner.

I INTRODUCTION

Mediation as a dispute resolution alternative plays an important role in the Australian civil justice system.¹ The tendency to use mediation processes is increasing worldwide.² Lawyers choose ADR more frequently and, most of the

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¹ Patricia Bergin, 'The Objectives, Scope and Focus of Mediation Legislation in Australia' (Conference Paper, 'Mediate First' Conference, 11 May 2012).

² Jacqueline Nolan-Haley, 'Mediation: The "New Arbitration"' (2012) 17 *Harvard Negotiation Law Review* 61.

time, this choice offers more time and cost-effective solutions to parties in the 'out-of-court' setting.³

The current literature presents several definitions of mediation.⁴ While the core elements of the mediation process are well established and supported by a large number of publications around the world, some pivotal and not completely understood, aspects of ADR still attract the attention of researchers. Specifically, these factors include legal, financial, psychological, behavioural as well as cultural implications and influences. When considered alongside the fascinating developments in the fields of genetics, microbiology, neuroscience, and behavioural sciences, these factors open new horizons in understanding and further exploring ADR techniques, including mediation.

In essence, this research purports to elucidate some possible grounds, influences and explanations for the foundation of conflict, and as a consequence, the mediation process and its outcomes. Relevantly, we will attempt to look beyond the regulatory framework of mediation and base our conclusions on the hierarchical 'bio-psycho-social model' (the 'Model'). Firstly, we will provide an introduction to the underlying concepts of biology, physics, biochemistry, physiology, sociology and psychology of a human being that play a part in the mediation process. We then integrate these concepts into ADR mechanisms and its underlying concepts. Lastly, we further explore possible practical applications of the concepts discussed in this study to the process of mediation.

We do not claim that this report is the most comprehensive research on the subject and accept that some of the ideas and inferences used in this study are located at the crossroads of two very different professional fields (bio-medical and legal). Hence, they could be seen as intangible and non-applicable for a practical lawyer/ADR practitioner. While this may mean that the inferences in this research need to be used with caution, the discoveries illustrated here are, in our humble opinion, invaluable in order to understand the underlying principles that occur in mediation.

II BIOPSYCHOSOCIAL MODEL

In 1977, George Engel, an American physician, recognised that to deal with a particular illness, physicians need to take into account not only isolated symptoms, but the patient as a whole including the context of his/her living social environment; behavioural and psychological dimensions; and the

³ Patricia Bergin, 'The Objectives, Scope and Focus of Mediation Legislation in Australia' (Conference Paper, 'Mediate First' Conference, 11 May 2012); Jacqueline Nolan-Haley, 'Mediation: The "New Arbitration"' (2012) 17 *Harvard Negotiation Law Review* 61.

⁴ Laurence Boulle and Rachael Field, *Australian Dispute Resolution Law and Practice* (LexisNexis, 2017); Patricia Bergin, 'The Objectives, Scope and Focus of Mediation Legislation in Australia' (Conference Paper, 'Mediate First' Conference, 11 May 2012); Jacqueline Nolan-Haley, 'Mediation: The "New Arbitration"' (2012) 17 *Harvard Negotiation Law Review* 61; Bond University, 'Dispute Resolution File' (Mediation Course Lecture, Bond University, 2019).

supportive systematic societal structure.⁵ Engel proposed the biopsychosocial model as a matrix for hierarchical organisational levels (Figure 1): the molecule; the cell; the tissue; the organ system; the person; the interpersonal dyad; the family; the community; the culture; the society-nation; and the biosphere⁶ The core concept of his theory is a simple observational statement that 'nature is a hierarchically arranged continuum, with its more complex larger units being superordinate to the less complex smaller units'⁷ and 'in the continuity of natural systems every unit is at the very same time both a whole and a part'.⁸ A system of any type cannot exist or function in isolation from the dynamic environment. Any system must have a continuous flow of information in order to maintain its stable configuration, yet must be able to constantly adapt to the dynamic network.⁹

Although Dr Engel's model was first published in 1977, its value increases with time and is applicable in fields of psychiatry and medicine to define and explain the 'biopsychosocial spectrum' with separate conditions at different points of the spectrum. Whilst some of the concepts may not be new, they present the foundational knowledge of the framework for studying human psyche. By comparison, some legal concepts and precedents that were established many decades ago, such as the 'Briginshaw test', still remain relevant and widely used in the current legal system.¹⁰ Interestingly, Engel did not invent the model – a fact that has been heavily criticised and condemned over the years. However, the concept of this model is considered by some as a mainstay of 'academic psychiatry' since its inception.¹¹ In our view, this paradigm is contributory and applicable to the legal profession which, akin to medicine, deals with human psychology, interactions and communications.¹² Consequently, it is applicable to ADR and mediation.

⁵ George L Engel, 'The Need for a New Medical Model: A Challenge for Biomedicine' (1977) 196(4286) *Science* 129, 129-136.

⁶ George L Engel, 'The Need for a New Medical Model: A Challenge for Biomedicine' (1977) 196(4286) *Science* 129, 129-136; George Engel, 'The Clinical Application of The Biopsychosocial Model' (1981) 6(2) *The Journal of Medicine and Philosophy* 101, 101-123.

⁷ George Engel, 'The Clinical Application of The Biopsychosocial Model' (1981) 6(2) *The Journal of Medicine and Philosophy* 101, 103.

⁸ Engel (n 7) 106.

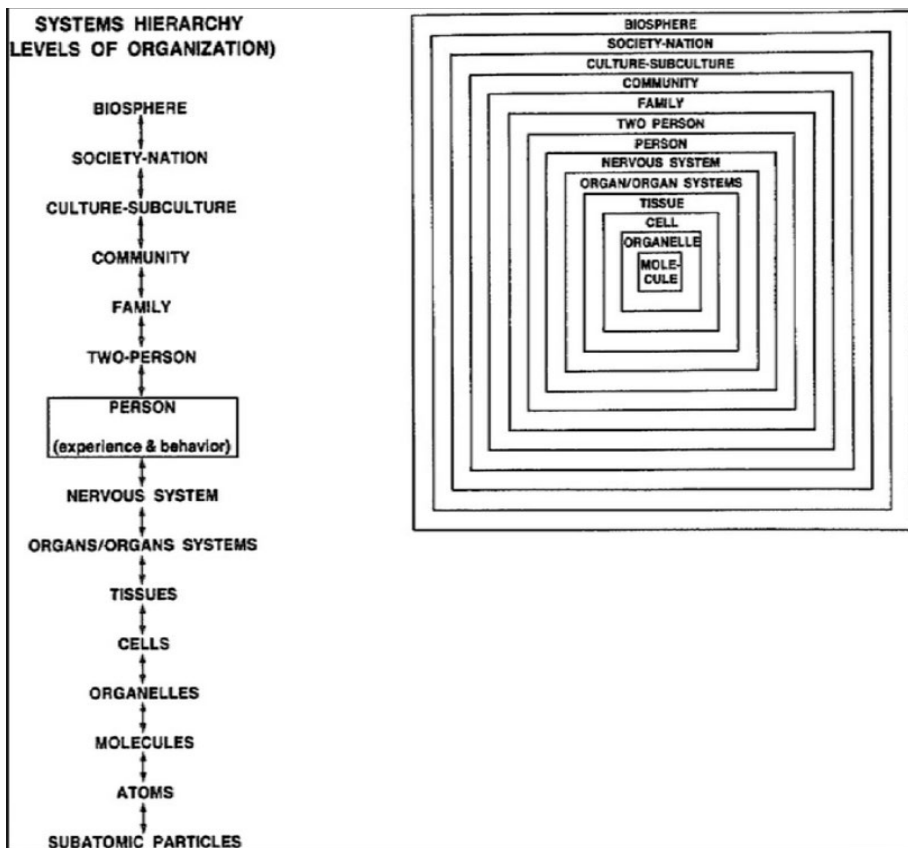
⁹ Ibid.

¹⁰ *Briginshaw v Briginshaw* (1938) 60 CLR 336.

¹¹ Niall McLaren, 'The Biopsychosocial Model: Reality Check' (2021) 55(7) *The Australian and New Zealand Journal of Psychiatry* 644, 644-645.

¹² Francesc Borrell-Carrio, Anthony Suchman and Ronald Epstein, 'The Biopsychosocial Model 25 Years Later: Principles, Practice, and Scientific Inquiry' (2004) 2(6) *Annals Of Family Medicine* 576.

Figure 1

From Engel 'The Clinical Application of The Biopsychosocial Model'¹³

III MEDIATION

As alluded to above, the literature offers a number of concepts to define mediation.¹⁴ All of these various sources share similar core attributing elements. As such, mediation is a structured process that aims to assist parties in conflict to achieve a mutually acceptable agreement through the involvement of a neutral third party, called a 'mediator'. The goal of mediation is, therefore, to achieve the maximum level of decision-making and problem-solving abilities of parties in dispute, aiming at the best possible outcome for

¹³ Engel (n 7).

¹⁴ Laurence Boulle and Rachael Field, *Australian Dispute Resolution Law and Practice* (LexisNexis, 2017); Patricia Bergin, 'The Objectives, Scope and Focus of Mediation Legislation in Australia' (Conference Paper, 'Mediate First' Conference, 11 May 2012); Jacqueline Nolan-Haley, 'Mediation: The "New Arbitration"' (2012) 17 *Harvard Negotiation Law Review* 61; Bond University, 'Dispute Resolution File' (Mediation Course Lecture, Bond University, 2019).

all involved.¹⁵ Hence, skilful mediator assistance may allow parties to carefully prepare for mediation; better achieve an understanding and awareness of the dispute; explore possible solutions; and come to a mutually satisfactory agreement, thereby maintaining the power balance.¹⁶ The process of mediation is neutral, impartial and highly ethical.¹⁷ If the mediation does not achieve an acceptable resolution for the parties involved, they may still proceed to litigation. However, the contents of disclosures made throughout the process of mediation will remain confidential and non-admissible in court proceedings. Furthermore, the parties to mediation are protected from media exposure unlike in court proceedings. Relevantly, mediation is usually a voluntary process unless mandated by the court.¹⁸ Bingham reported that irrespective of being voluntary or mandatory, in approximately 78% of employment dispute claims, mediation achieves complete resolution.¹⁹

IV STRESS AND CONFLICT

Understanding the concept of 'conflict' is useful in understanding the mediation process. Boule and Field define conflict as:

situations of tension, stress or friction among different individuals, groups or countries, accompanied by perceived threats to one or both sides' interests and goals but without any specific presenting claims or overt activities.²⁰

The term 'dispute' usually refers to the 'situation of greater specificity, intensity and legal relevance than is the case with "conflict".²¹ Determinative dispute resolution processes like litigation or arbitration have a more pronounced distinction between these terms.²² However, in mediation this distinction is less clear. Hence, for the purposes of this article the terms 'dispute' and 'conflict' will be used in a wider sense and at times interchangeably.

The relationship between stress and conflict frequently attract negative connotations. However, the original concept is that stress is a physiological response to various demands: environmental, psychological and physiological. 'Eustress' refers to positive stress and 'distress' refers to negative stress. It is important to emphasize that stress has not only damaging effects, but also fulfils the protective function of allowing an individual to adapt to a changing environment. Psychological distress usually relates to three types of stress-induced experiences: psychological pressure (in cases of deadlines or heavy

¹⁵ Mediator Standards Board, 'National Mediation Accreditation System', (PDF, 1 July 2015) <<https://msb.org.au/themes/msb/assets/documents/national-mediator-accreditation-system-2015.pdf>>.

¹⁶ Ibid.

¹⁷ Ibid.

¹⁸ Bergin (n 1).

¹⁹ Lisa Bingham, 'Employment Dispute Resolution: The Case for Mediation' (2004) 22(1-2) *Conflict Resolution Quarterly* 145, 145-174.

²⁰ Laurence Boule and Rachael Field, *Australian Dispute Resolution Law and Practice* (LexisNexis, 2017) 157.

²¹ Ibid 158.

²² Ibid.

workload), conflict (when a person is torn in different directions) and frustration (when individuals have multiple barriers to achieving their goal).²³

These concepts and their combinations are valuable in assessing conflict and its associated issues in ADR. Consequently, we will now look at these concepts through the prism of the model.

V APPLICATION OF THE BIOPSYCHOSOCIAL HIERARCHY TO MEDIATION PROCESS

A *Atom*

Novel biophysical studies cannot be ignored if one wishes to get a deep understanding of the underlying mechanisms of the conflict process. Although an effort to incorporate quantum physics into conflict analysis may be original, we will only touch on the subject briefly, to the extent that is consistent with the hierarchical model outlined in this article.

As such, Ji believes that wave-particle duality theory (any physical matter may act as a wave or as a particle) is a foundation of the majority of neurobiological processes.²⁴ The frequency and amplitude of waves per time unit affects the particle or substance production and function. Some examples of this may include, but are not limited to, the molecule synthesis process; cell metabolism; and transmission of brain wave stimuli. All of these processes regulate decision-making time, speech rate and other relevant performance measures which are essential in achieving a desired goal in mediation. Oehrns and colleagues, from Bonn University, Germany, used the electroencephalogram ('EEG') to record brain wave activity in the different prefrontal cortex areas to explore individuals' responses in cognitively conflicting situations. These studies infer that brain wave stimuli at a different frequency range synchronise the opening and closing time in nerve cells during neurotransmission between different cortex areas.²⁵

At this moment in time, it is difficult to find a direct application of this knowledge to a particular skill during mediation. However, it supports the model's hierarchy and provides further grounds for searching for a connection between atomic processes as well as human conflict detection, control and resolution.

B *Molecule*

Despite the widespread belief that the human brain cells stop developing when we reach adulthood, the latest discoveries in the area of brain neuroplasticity (the ability of the brain to adapt) suggest otherwise. This

²³ Bruce McEwen, 'Stressed or Stressed Out: What is the Difference?' (2005) 30(5) *Journal of Psychiatry Neuroscience* 315, 315-318.

²⁴ Sungchul Ji, 'Wave-Particle Duality in Molecular Machines, Living Cells, and Human Brains' (2015) 108(2) *Biophysical Journal* 741.

²⁵ Carina Oehrns et al, 'Neural Communication Patterns Underlying Conflict Detection, Resolution, And Adaptation' (2014) 34(31) *The Journal of Neuroscience*.

means that humans are able to improve cognitive function; adapt and modify behaviour; and change personal views despite holding previous negative memories of conflicts they had experienced.²⁶ In the framework of mediation, the application of this knowledge is significant.

As such, the group of unique protein molecules in the brain known as neurotrophins, act as growth factors for nerve cells (neurons). Neurotrophins are responsible for multiplication, differentiation (cell changing to perform a specific function) and regeneration of neurons. At this moment, one of the most well researched neurotrophins is the brain-derived neurotrophic factor ('BDNF').²⁷ The BDNF promotes the growth of new cells and connectivity of the neurons, and is connected to facilitating behavioural adaptation.²⁸ Further, this protein molecule helps in learning new skills, adapting to the ever-changing environment by developing optimal responses, and regulates memory and neuroplasticity.²⁹ Acute stress may reduce BDNF production and, as a result, diminish cognitive performance as well as negatively affect neuroplasticity and the process of adaptation.³⁰ This is the one of the biological reasons of how prolonged stressful situation could affect various abilities of the mediation participants. These include attention, memory, reasoning, problem solving and decision making.

C Cell Level

It is trite and repetitive, but we again note that society sees conflict in a negative light.³¹ The research data suggests that the negativity associated with conflict situations can be traced back to early childhood and may be explained by a number of factors.³²

Further, it is well-established that early childhood exposure to traumatic and highly stressful adverse situations may cause emotional dysregulation;

²⁶ Daniel Weitz, 'The Brains Behind Mediation: Reflection on Neuroscience, Conflict Resolution and Decision Making' (2011) 12 *Cardozo Journal of Conflict Resolution* 471, 471-490.

²⁷ Iva Dincheva, Niccola Lynch and Francis Lee, 'The Role of BDNF in the Development of Fear Learning' (2016) 33(10) *Depression And Anxiety* 907, 907-916; Daniel Weitz, 'The Brains Behind Mediation: Reflection on Neuroscience, Conflict Resolution and Decision Making' (2011) 12(2) *Cardozo Journal of Conflict Resolution* 471, 471-490.

²⁸ Iva Dincheva, Niccola Lynch and Francis Lee, 'The Role of BDNF in the Development of Fear Learning' (2016) 33(10) *Depression And Anxiety* 907, 907-916.

²⁹ Yan Zhen et al, 'Low BDNF is Associated with Cognitive Deficits in Patients with Type 2 Diabetes' (2013) 227(1) *Psychopharmacology* 93, 93-100.

³⁰ Laura Mandelli et al, 'Genes Involved in Neuroplasticity and Stressful Life Events Act on the Short-Term Response to Antidepressant Treatment: A Complex Interplay between Genetics and Environment' (2014) 29(4) *Human Psychopharmacology: Clinical And Experimental* 388, 388-391; Yan Zhen et al, 'Low BDNF is Associated with Cognitive Deficits in Patients with Type 2 Diabetes' (2013) 227(1) *Psychopharmacology* 93, 93-100.

³¹ Laurence Boulle and Rachael Field, *Australian Dispute Resolution Law and Practice* (LexisNexis, 2017); Daniel Weitz, 'The Brains Behind Mediation: Reflection on Neuroscience, Conflict Resolution and Decision Making' (2011) 12(2) *Cardozo Journal of Conflict Resolution* 471, 471-490; Bond University, 'Dispute Resolution File' (Mediation Course Lecture, Bond University, 2019).

³² Weitz (n 26)

mental health problems; interpersonal and relationship difficulties; and a pattern of maladaptive coping strategies.³² It is common knowledge that each cell contains the molecules of deoxyribonucleic acid ('DNA'). Genomic DNA carries instruction codes for production of proteins which ensure complex functioning of the human body. It has been hypothesised that epigenetic changes can provide an explanation connecting childhood adversities and emotional challenges later in life. Relevantly, the evidence points out that a stressful event may influence the DNA structure by adding a chemical tag. One such example is the process of methylation where a 'methyl' group is added to a DNA segment.³³ The DNA code remains unchanged, yet the final gene product may be different where the altered gene is turned on or off by the lifetime experiences of an individual.³⁴ This may lead to changes in behaviour (eg stronger fear response) and, potentially, in the way of an individual perceiving conflict as well as resolving or acting in conflict situations.³⁵

D Tissue

It is postulated that humans are able to imitate facial expressions from the first day of their lives.³⁶ The progression of this is the ability to recognise verbal and non-verbal conflicting cues; and develop adaptive behavioural mechanisms that occur later in life. The so-called mirror neuronal system is the foundation of the escalation and de-escalation process; and the social cognitive conflict resolution.³⁷ An example of this is a person having a conversation. He or she perceives the content of such a conversation via the auditory (hearing) system. The sound is then transmitted to the responsible areas of the cerebral cortex (outer layer of the brain). The mirror neurons simultaneously send data about the observed non-verbal cues (for example, persons describe a distressing accident with a smile on their faces) to the limbic system. The limbic system is another part of the brain involved in emotional and behavioural processes. Synthesis of these non-congruent messages produces an emotion and, consequently, a behavioural response in the listener.³⁸ In a way, mirror neurons allow a person to coherently predict

³² Sarah E. Romens et al, 'Associations Between Early Life Stress and Gene Methylation in Children' (2015) 86(1) *Child Development* 303, 303–309; Zhou Deng et al, 'Regional Gray Matter Density Associated with Emotional Conflict Resolution: Evidence from Voxel-Based Morphometry' (2014) 275 (September) *Neuroscience* 500, 500–507.

³³ Zoya Marinova et al, 'DNA Methylation Profiles of Elderly Individuals Subjected to Indentured Childhood Labor and Trauma' (2017) 18 *BMC Medical Genetics* 21.

³⁴ Sarah E. Romens et al, 'Associations between Early Life Stress and Gene Methylation in Children' (2015) 86(1) *Child Development* 303–309; Daniel Shaughnessy et al, 'Mitochondria, Energetics, Epigenetics, and Cellular Responses to Stress' (2014) 122(12) *Environmental Health Perspectives* 1271.

³⁵ Weitz (n 26).

³⁶ *Ibid.*

³⁷ Daniel Weitz, 'The Brains behind Mediation: Reflection on Neuroscience, Conflict Resolution and Decision Making' (2011) 12(2) *Cardozo Journal of Conflict Resolution* 471, 471–490; Jamil Zaki et al, 'Social Cognitive Conflict Resolution: Contribution of Domain-General and Domain-Specific Neural Systems' (2010) 30(25) *Journal of Neuroscience* 8481, 8481–8488.

³⁸ *Ibid.*

possible intentions of the opposing side as well as get a sense of their feelings and experiences. Consequently, the risk of conflict escalates when integrated emotional and social cues are incongruent or underdetermined.³⁹ On the other hand, the mirror neuronal system can be activated by an individual's learned social experiences that could potentially limit the perception of an event on a subconscious level.⁴⁰ Hence, utilising techniques to 'streamline' information for the mirror neurons would help to de-escalate rising conflict situations during the mediation process.⁴¹ Some of these techniques include: the use of an opening statement; the show of mutual respect for parties' venting their frustration; reframing; and the regular summarising of concerns of the conflicting parties, at various stages of the process, by the mediator.

Another important discovery to discuss in this section of our article is the new functional role of myelin - the well-known nerve insulator.⁴² Myelin is formed by a supplementary brain cell's extended membrane, which is wrapped around conducting neurons as a multi-layered sheath. Kaller and colleagues experimentally looked at the supportive and conductive function of the myelin and demonstrated that myelination is a dynamic process which is regulated by life experiences and plays an important role in learned behavioural changes.⁴³ Neuronal plasticity allows a person to change their view of conflict and make necessary changes in order to assist in its resolution.

E *Organ*

It is worthwhile mentioning a discussion in the literature about the differences in function between the right and left sides of the brain. The research suggests that the left hemisphere is mostly responsible for narrow focussed tasks, decision-making, logical thinking, algorithms, self-centred approach and competition. The right hemisphere is responsible for empathy and the broader holistic perception of our experiences; and cooperative and collaborative behaviour.⁴⁵ The right side of the brain thus allows for recognition and the ensuing actions based on perceived emotions, either via

³⁹ Jamil Zaki et al, 'Social Cognitive Conflict Resolution: Contribution of Domain-General and Domain-Specific Neural Systems' (2010) 30(25) *Journal of Neuroscience* 8481, 8481-8488.

⁴⁰ Stephen Turner, 'Making The Tacit Explicit' (2012) 42(4) *Journal For The Theory of Social Behaviour* 385, 385-402.

⁴¹ Weitz (n 26).

⁴² Daniel Weitz, 'The Brains behind Mediation: Reflection on Neuroscience, Conflict Resolution and Decision Making' (2011) 12(2) *Cardozo Journal of Conflict Resolution* 471, 471-490; Sarah E. Romens et al, 'Associations between Early Life Stress and Gene Methylation in Children' (2015) 86(1) *Child Development* 303, 303-309.

⁴³ Malte Kaller et al, 'Plasticity and Behaviour – Connecting the Dots' (2017) 47 (December) *Current Opinion In Neurobiology* 86, 86-92.

⁴⁵ Pam Hruska et al, 'Hemispheric Activation Differences in Novice and Expert Clinicians during Clinical Decision Making' (2016) 21(5) *Advances in Health Sciences Education* 921, 921-933; Zhou Deng et al, 'Regional Gray Matter Density Associated with Emotional Conflict Resolution: Evidence from Voxel-Based Morphometry' (2014) 275 (September) *Neuroscience* 500, 500-507; Daniel Weitz, 'The Brains behind Mediation: Reflection on Neuroscience, Conflict Resolution and Decision Making' (2011) 12(2) *Cardozo Journal of Conflict Resolution* 471, 471-490.

verbal or non-verbal cues. Furthermore, this function allows for the recognition of alternative views and helps in understanding the arguments of the other side.⁴⁴

“We must learn to use a different kind of seeing, to be vigilant not to allow the right hemisphere’s options to be too quickly foreclosed by the narrower focusing of the left hemisphere”.⁴⁵ According to Weitz, a mediator may use strategies activating the right side of the brain to achieve the best collaborative result in ADR.⁴⁶ Interestingly, a technique as easy as, for example, forced one-sided left nostril yoga breathing⁴⁷ or the use of colours⁴⁸ may assist in activation of the right hemisphere’s function. As such, in ‘setting the scene’ for mediation, practitioners may use colour printed handout material rather than black and white copies and/or add colourful accent in the mediation room design such as in wall art or furniture upholstery fabric.

Notably, the recent research by Hruska and peers, revealed more complex mechanisms of the hemispheric activation.⁴⁹ This elegant study concurred with existing research findings in relation to solving simple tasks. To solve easy dilemmas, novice and experienced practitioners manifested activation of the left hemispheric areas of the cortex. By comparison, for the resolution of complex problems, less experienced practitioners solved them by still activating their left hemisphere, whereas more experienced practitioners showed a more intense involvement of the right hemisphere. Hence, experts employed a more holistic experience-based approach and assessment of the current situation, rather than applying knowledge based only on rules and norms – more typical to junior practitioners. As such, during the mediation process, an experienced practitioner would perceive any given conflict situation more comprehensively and better tailor mediation to its participants, making it more efficient and effective. Ultimately, this knowledge serves both purposes: to masterfully solve conflicts and train junior practitioners this mastery.

⁴⁴ Kaller et al (n 44).

⁴⁵ Weitz (n 26) 483.

⁴⁶ Ibid.

⁴⁷ P. Raghuraj and S. Telles, ‘Right Uninostril Yoga Breathing Influences Ipsilateral Components of Middle Latency Auditory Evoked Potentials’ (2004) 25(5) *Neurological Science* 274; Karamjit Singh, Hemant Bargav and T Srinivasan, ‘Effect of Uninostril Yoga Breathing On Brain Hemodynamics: A Functional Near-Infrared Spectroscopy Study’ (2016) 9(1) *International Journal Of Yoga* 12, 12-19.

⁴⁸ Isadore Sonnier and Martha Dow, ‘The Right Hemisphere: Seat of Emotion Colors’ (2001) 105 (No 4) *Education* 373; Anita Kitchens, William Barber and Dianne Barber, ‘Left Brain/Right Brain Theory: Implications for Developmental Math Instruction’ (1991) 8(3) *Review Of Research In Developmental Education* 3.

⁴⁹ Pam Hruska et al ‘Hemispheric Activation Differences in Novice and Expert Clinicians during Clinical Decision Making’ (2016) 21(5) *Advances in Health Sciences Education: Theory and Practice* 921, 921-933.

F *Organ Systems*

As mentioned previously, an early exposure to trauma may activate epigenetic changes and consequently change the functioning of the glucocorticoid hormonal system.

During acute stress, the hypothalamus (small area in the brain) produces corticotropin-releasing hormone ('CRH'). CRH in turn activates the production of adrenocortico-tropic hormone ('ACTH') by the pituitary gland (the main endocrine gland located in the brain). Reaching the adrenal gland via bloodstream, ACTH influences it causing the release of cortisol, adrenalin and noradrenalin (hormones). Cortisol binds glucocorticoid receptors in the hippocampus (another brain area) and closes the biofeedback loop by inhibiting CRH synthesis. This mechanism is altered in individuals with an early life exposure to trauma. The number of glucocorticoid binding receptors is reduced, which causes problems in the stress hormone regulatory system.⁵⁰

Further, the hippocampus, amygdala and prefrontal cortex of the brain are believed to be involved in memory production. This occurs through the release of adrenalin and cortisol during an acute stressful event. This process of 'memory creation' may protect an individual against future exposure to a threatening situation. However, if the exposure is repeated or is of a continuous nature, it causes neuron atrophy. As a consequence, the memory deteriorates, potentially causing a state of fear and latency in responding, or a "freeze" state which leads to the reluctance, or even inability to participate in conflict resolution.⁵¹ Hence, understanding the underlying neuroscientific processes behind behavioural reactions in individuals who have experienced previous negative conflict situations can allow practitioners to effectively target these behaviours, opening new perspectives in the mediation practice. Mediators may become aware of these previous experiences and observe consequent physiological changes in participants during the exploration stage of mediation.

G *Nervous System*

Novel findings using magnetic resonance imaging ('MRI') of the brain by Deng and colleagues, showed brain structure correlation with the ability of an individual to regulate their emotional incongruence in conflicting situations.⁵² They suggested that more grey matter density in certain brain regions (for example, wide spread areas of prefrontal cortex) was associated with a better ability to detect conflict and to monitor personal emotional states. As a

⁵⁰ Sarah E. Romens et al, 'Associations between Early Life Stress and Gene Methylation in Children' (2015) 86(1) *Child Development* 303, 303–309.

⁵¹ Daniel Coleman, *Emotional Intelligence* (Bantam Books, 1st Ed, 1995); Bruce McEwen, 'Stressed or Stressed Out: What is the Difference?' (2005) 30(5) *Journal of Psychiatry Neuroscience* 315, 315–318.

⁵² Zhou Deng et al, 'Regional Gray Matter Density Associated with Emotional Conflict Resolution: Evidence from Voxel-Based Morphometry' (2014) 275 (September) *Neuroscience* 500, 500–507.

consequence, individuals with higher brain grey matter density (individual structural nervous system differences) are more efficient in controlling their impulsive behaviour and emotions. This finding could explain why some participants may need more time or additional explanation from the mediator for emotional recognition and regulation in the process of mediation.⁵³ The authors also suggest that the ability to recognise emotional incongruence could be affected by mental illness, for example, generalised anxiety disorder. Potentially, having relevant knowledge about participants' prior psychiatric history may help to structure and plan a mediation session.

H *Person (Experience and Behaviour)*

Weitz,⁵⁴ citing the Cummings experiment, stated that children exposed to marital conflicts can gain positive experiences from such situations. The key was for a child to witness all parts: conflict evolution, resolution and closure as opposed to remaining in a guessing state about the outcome of such conflict. Hence, the learned negative perspective of the conflict potentially prevents parties from entering mediation process as a dispute resolution option. Moreover, some individuals invested time, finances, thoughts and energy in order to remain in the state of conflict. Thus, their resistant behaviour can be explained by the inability to diverge from the readiness to fight on the subconscious level.

As was discussed earlier, genetic factors may explain some key differences in an individuals' response to stress and their ability to cope with it. At the same time, the latest research shows that stress coping styles can be altered in adults through their life experiences.⁵⁵ Firstly, the existing family environment assists in shaping how people cope with day-to-day stress. Secondly, coping styles correlate with age. Younger people utilise active problem solving; and interpersonal and social support seeking behaviours. Older people tend to reveal avoidant and distancing patterns of passive and emotionally withdrawn coping styles.⁵⁶ These findings suggest that the negative view of the conflict can be influenced and changed.⁵⁷ Furthermore, recognising that unaddressed basic needs (for example, lack of sleep and being hungry or cold) may further perpetuate stress induced behaviour.⁵⁸

Another interesting discovery is that individually learned coping mechanisms are inter-generational. Some early but fascinating research in this area suggests that mothering styles can override genetic predisposition

⁵³ Deng et al. (n 54).

⁵⁴ Wietz (n 26).

⁵⁵ Yoon-Mi Hur et al, 'Age Differences in Genetic and Environmental Variations in Stress-Coping During Adulthood' (2012) 42(4) *Behavioural Genetics* 541, 541-548.

⁵⁶ Ibid.

⁵⁷ Wietz (n 26).

⁵⁸ Laurence Boulle and Nadja Alexander, *Mediation: Skills and Techniques* (LexisNexis Butterworths, 2nd Ed, 2012); Leonard Riskin, 'Managing Inner And Outer Conflict: Selves, Subpersonalities And Internal Family Systems' (2013) 18 (Spring) *Harvard Negotiation Law Review* 1, 1-69.

and even can be translated into the next generation. For example, despite being brought up in a dysfunctional family with an emotionally unavailable mother, an individual may develop nurturing parental skills as well as implement positive changes and experiences in upbringing own offspring.⁵⁹ Integration of these research findings into the mediation process may help resolve conflicts in a more constructive way.⁶⁰

On the other end of the personal influence spectrum in the mediation process and outcome, is the mediator's professional skills and experience. Applying the above-discussed concepts of mirror neurons or brain inter-hemispheric functioning to problem-solving may enhance mediator's professional knowledge and skills. For example, a mediator's opening statement plays a significant role in the mediation process.⁶¹ The statement is usually delivered in accordance with the National Mediator Accreditation System Practice Standards.⁶² The primary aim of this statement is to create a constructive and collaborative climate; educate parties about the process; develop trust; and encourage understanding and information exchange which will set the scene for a productive 'conflict resolution mood'. Relevantly, a study by Wietz, supports that the 'priming effect'⁶³ of the opening statement plays a pivotal role on the attitude of the disputants and, consequently, the outcome of the mediation. As such, a carefully structured opening statement using 'priming' words, may help parties to be more collaborative; to neutralise pre-existing negative beliefs; and to be more open toward the resolution of the problem.⁶⁴

I *Two Person Model (Doctor, Family Member, Co-worker, Friend and Others)*

It is established that current emotional state is likely to influence a person's behaviour with others. Furthermore, expressed emotions in interpersonal social situations are perceived differently by others and may attract various responses, particularly when compliance is required. A group of researchers led by van Doorn, from the Netherlands, concluded that individuals with a positive affective state are more likely to agree with requests.⁶⁵ Whereas, people in a state of fear, anger, disappointment or embarrassment are less

⁵⁹ Nasim Ahmadiyeh et al, 'Lineage is an Epigenetic Modifier of QTL Influencing Behavioural Coping With Stress' (2005) 35(2) *Behavioural Genetics* 189, 189-198.

⁶⁰ Wietz (n 26).

⁶¹ Laurence Boulle and Nadja Alexander, *Mediation: Skills And Techniques* (LexisNexis Butterworths, 2nd Ed, 2012).

⁶² Laurence Boulle and Nadja Alexander, *Mediation: Skills And Techniques* (LexisNexis Butterworths, 2nd Ed, 2012); Mediator Standards Board, 'National Mediation Accreditation System', (PDF, 1 July 2015) <<https://msb.org.au/themes/msb/assets/documents/national-mediator-accreditation-system-2015.pdf>>.

⁶³ Wietz (n 26) 478.

⁶⁴ Ibid.

⁶⁵ Evert van Doorn, Gerben van Kleef and Joop van der Pligt, 'How Emotional Expressions Shape Prosocial Behavior: Interpersonal Effects of Anger and Disappointment on Compliance with Requests' (2015) 39(1) *Motivation and Emotion* 128, 128-141.

likely to comply. It was further discovered that on a personal emotional level disappointment was associated with a sense of loss of control, low status and feeling powerless. Anger, on the other hand, was associated with a sense of dominance, power and a tendency to blame the other party. Interestingly, both emotions (disappointment and anger) signal to the other party that participants have expected a different social behaviour and that their perceived expectations were violated. The significance of this information in relation to the mediation process is that the expression of disappointment, rather than anger, produces a better outcome in compliance with requests of the other party. This could explain why anger, resistance and unpleasant experiences of a conflict situation, presenting as an emotional barrier at the beginning of the mediation process, can transition into more enthusiastic involvement with a positive learning outcome in the end.⁶⁶

Boulle and Field, describe the concept of the 'high conflict'.⁶⁷ High conflict phenomena refers to situations involving expressed emotions of anger, frustration and fear, with the associated urge for reprisal and punishment. Individuals with emotionally unstable personality disorders or a predisposition for conflict are likely to be in the epicentre of high-level conflicts, and the anger expressed by one of the disputants causes a hostile response in the opposite party. Moreover, in these circumstances, a low-end conflict may potentially escalate to an extremely high state of conflict. Therefore, practicing lawyers must be aware of the potential risks and be able to tailor the ADR process to the parties' needs.

J *Family (Nuclear or Extended)*

Family dynamics and intergenerational interactions again bring us to the discussion of the negative perception of conflict, but now as a conditioned response rather than an unshakable belief. The negative view of a conflict and, consequently, the behaviour as a conditioned response, can be changed based on the brain adaptation ability. The brain neuroplasticity could be reflective of one's own experiences or their observed encounters.⁶⁸ Individuals may have a negative view of conflict based on their own experiences. Furthermore, he or she may have learned a non-productive or combative way to resolve the conflict situation via observation of members of their family. But observation of another person's approach in dealing with conflict in a non-confrontational and collaborative manner may lead to an adaptive change in one's behaviour. In other words, the observed action has

⁶⁶ Jaya Kannan and John Miller, 'The Positive Role of Negative Emotions: Fear, Anxiety, Conflict and Resistance as Productive Experiences in Academic Study and in the Emergence of Learner Autonomy' (2009) 20(2) *International Journal Of Teaching and Learning in High Education* 144, 144-145.

⁶⁷ Boulle (n 20) 157.

⁶⁸ Wietz (n 26).

a similar effect on the perception of conflict and its resolution, as if individual had experienced it as their own conflict.⁶⁹

Attributing negativity to conflict may affect the behaviour of participants during mediation or even influence their position about entering the process. Furthermore, this theory may explain why participants may adapt a competitive rather than a collaborative approach during the mediation process.⁷⁰

K *Community (Health Care, Work, Neighbourhood, Social, Recreational and Others)*

According to Bingham, communication problems in teams and along the chain of command are some of the most common reasons for employee dissatisfaction and complaints.⁷¹ A group of researchers identified a few practical applications in the context of managing a large company.⁷² They explored the concept of constructive controversy, defined as ‘an open-minded discussion of a conflict and opposing views with others’.⁷³ An individual is faced with the fact that his/hers own ideas, views, conclusions, opinions and experiences on how to deal with conflict are challenged by an opposing view. When a discussion about the conflict is approached from a constructive rather than a destructive point of view, an individual may benefit in a number of ways. Firstly, an individual could gain some personal development skills such as: increased self-esteem, confidence and changes in attitude, as well as the positive perspective of conflict via cognitive reasoning. The authors define positive conflict value as ‘attitudes that appreciate the usefulness of conflict and actions that emphasize approaching and openly discussing conflict’.⁷⁴ Secondly, an individual is able to be more focused and engaged with the given task which increases work performance. When a person feels psychologically safe, he or she perceives the risk of being humiliated, embarrassed or punished as low. As a result, it is easier for the person to be innovative, efficient, motivated and seek help if necessary. The opposing discovery of this study is that a high level of psychological safety may lead to less goal directive thinking and irrelevant activities at work. The authors suggest addressing this duality of psychological safety with appropriate leadership that focuses on individual approaches toward employees and an establishment of boundary conditions. Thirdly, constructive controversy improves interpersonal relationships in the workplace. The findings suggest that individuals who have skills to constructively resolve conflicts feel more connected and appreciated

⁶⁹ Jasper Winkel et al, ‘Observed and Self-Experienced Conflict Induce Similar Behavioural and Neural Adaptation’ (2012) 7(4) *Social Neuroscience* 385, 385-397.

⁷⁰ Wietz (n 26).

⁷¹ Bingham (n 19).

⁷² Zhanying Ou et al, ‘Constructive Controversy and Creative Process Engagement: The Roles of Positive Conflict Value, Cognitive Flexibility, and Psychological Safety’ (2018) 48(2) *Journal of Applied Social Psychology* 101, 101-113.

⁷³ Ou (n 74) 102.

⁷⁴ Ibid 103.

at work. Fourthly, constructive controversy increases group interaction and improves the effective decision-making within a team.⁷⁵ This research highlights potential psychological issues in the workplace which are commonly referred to mediation. Bingham highlighted the importance of early mediating intervention as a prerequisite for higher satisfaction with the mediation process and its outcomes.⁷⁶

L *Culture-Subculture (Age, Sex, Class, Religion, Education, Economic and Others)*

The Australian Mediator Standards Board Practice Standards outline the requirements for a mediator to have the knowledge and skills on 'cross-cultural issues'.⁷⁷ Cultural awareness and sensitivity from the mediator's perspective on the one hand, and the underlying cultural influences, perceptions and behaviour of the culturally diverse mediation participants on the other, is a highly complex concept and presents a challenge even for an adept mediator.⁷⁸ The cultural perspective may, for example, affect the conflict perception; communication styles; the authority figure influence; femininity-masculinity dimension; uncertainty tolerance; and consequently, the outcome of the mediation process.⁷⁹

In collectivist cultures, like Japanese, Korean and Chinese, a preservation of an honourable reputation in the eyes of the society; a devotion to the group; and the high moral grounds of being treated with dignity and respect are essential values. But they can be hidden and difficult to elicit during the mediation process.⁸⁰ Morris and Leung, explored factors affecting payout expectations in employment dispute claims.⁸¹ They found that a fair judgement for Americans was linked to job performance and work effort. The Korean participants placed more importance on the level of education, family size and seniority. Notably, the Japanese participants showed a clear correlation between seniority and the level of compensation. The dispute may

⁷⁵ Ou (n 74).

⁷⁶ Ibid.

⁷⁷ Mediator Standards Board (n 15).

⁷⁸ Laurence Boulle and Nadja Alexander, *Mediation: Skills and Techniques* (LexisNexis Butterworths, 2nd Ed, 2012); Harold Abramson, 'Selecting Mediators And Representing Clients In Cross-Cultural Disputes' (2006) 7(2) *Cardozo Journal Of Conflict Resolution* 253, 253-275.

⁷⁹ Laurence Boulle and Nadja Alexander, *Mediation: Skills and Techniques* (LexisNexis Butterworths, 2nd Ed, 2012).

⁸⁰ Harold Abramson, 'Selecting Mediators and Representing Clients in Cross-Cultural Disputes' (2006) 7(2) *Cardozo Journal Of Conflict Resolution* 253, 253-275; Michael Morris and Kwok Leung, 'Justice for All? Progress in Research on Cultural Variation in the Psychology of Distributive and Procedural Justice' (2000) 49(1) *Applied Psychology: An International Review* 100, 100-132.

⁸¹ Michael Morris and Kwok Leung, 'Justice for All? Progress in Research on Cultural Variation in the Psychology of Distributive and Procedural Justice' (2000) 49(1) *Applied Psychology: An International Review* 100, 100-132.

have an additional layer of complexity due to the notion that the outcome has to be ethically appropriate for the cultural community.⁸²

Collectivistic societies are described by interpersonal closeness between members and conflicting situations usually involve people who know each other very well. Women tend to preserve relationships, while men try to avoid conflicting situations.⁸³ At the same time, the research revealed gender-based differences in perceptions of a mediator. Female mediators were perceived as less controlling than male ones, even when trained mediators used calibrated techniques for the mediation process.⁸⁴

Lind et al, found that the concept of fairness is important for all individuals in dispute resolution, irrespective of their culture and gender.⁸⁵ They found that the core difference in perception of conflict resolution is 'which procedure is most fair'.⁸⁶ Professor Riskin,⁸⁷ developed a preference grid adjustable to mediator approaches most commonly used around the world, ranging from facilitative to varying degrees of directive mediation.

The vertical axis reflects the parties'/lawyers' composite preference for a mediator although the preference of each lawyer and each client may differ, especially in a cross-cultural mediation. A separate preference axis could be mapped for each participant. The vertical axis in the grid reflects the result negotiated by the participants among themselves regarding the sort of mediator they want to select. Presumably, it is a result that fits the cultural needs of the parties.⁸⁸

Riskin also emphasized that mediation is a dynamic process, and a mediator may need to adjust, particularly in culturally nuanced disputes.⁸⁹

M *Society-Nation*

To support the high standards of mediation practice in Australia the Mediator Standards Board was established. In 2008, the National Mediator Accreditation System ('NMA') was introduced. One of the functions was to provide guidance in the approval and practice standards.⁹⁰ Mediation found a wide application in areas of employment, family, community, native title claims and others.⁹¹ However, the procedural and legal aspects of the mediation as the ADR will not be discussed in this paper.

⁸² Harold Abramson, 'Selecting Mediators and Representing Clients in Cross-Cultural Disputes' (2006) 7(2) *Cardozo Journal Of Conflict Resolution* 253, 253-275.

⁸³ Cristina Montiel and Klaus Boehnke, 'Preferred Attributes of Effective Conflict Resolvers In Seven Societies: Culture, Developmental Level, and Gender Differences' (2000) 30(5) *Journal Of Applied Social Psychology* 1071, 1071-1094.

⁸⁴ Ibid.

⁸⁵ Allan Lind, Yuen Huo and Tom Tyler, 'Justice for All: Ethnicity, Gender, and Preferences for Dispute Resolution Procedures' (1994) 18(3) *Law And Human Behaviour* 269, 269-290.

⁸⁶ Lind (n 87) 287.

⁸⁷ Abramson (n 84).

⁸⁸ Ibid 270.

⁸⁹ Ibid.

⁹⁰ Mediator Standards Board, *About MSB*, (Web Page, 2019) Mediator Standards Board <<https://msb.org.au/about-msb>>.

⁹¹ Boulle (n 20).

N *Biosphere*

The biosphere as a dimension may concern more global and ecological aspects of conflict. An example of this is the link between cultural and historical aspects of humans and biodiversity of Australia. Incidentally, this would be of particular importance in relation to First Nations Australians. For Indigenous Australians the concept of a relationship between the land and self are inseparable and called 'connection to Country'.⁹² Furthermore, the philosophy incorporates the extended family and ancestors 'set in a time framework that includes the past, present and future, and able to be analysed appropriately only by considering this network of relationships'.⁹³ The perception of conflict in Indigenous population differs from the Western culture by focusing on the inter-connections with self and the community. Walker states that Indigenous culture expands the location and venue settings of dispute resolution, taking it closer to nature to maintain a link with the land.

Aboriginal people

Are of that place

And that place is of them, too.

You can't separate the two.

So, the land, the place,

The sea, water, air,

Air flows, the wind

And the creatures

Are part of you

And you are part of that whole...⁹⁴

The attempt to understand, respect and reflect on the other culture is a complex and constantly changing task for the practising mediator.

VI CONCLUSION

The evidence presented in this paper shows the potential connections of neuroscientific discoveries to the topic of ADR. Our study has some limitations. NMAS standards⁹⁵ outline the set of skills and knowledge which a competent mediator must have. Our paper offers some bioscientific insights which are currently not part of this set. However, utilising this scientific biomedical approach may help to better understand the nature of conflict or cross-

⁹² Australians Together, *The Importance of Land* (Web Page, 2019) <<https://australiantogether.org.au/discover/indigenous-culture/the-importance-of-land/>>.

⁹³ Polly Walker, 'Concepts of the Self: Implications for Cross-Cultural Conflict Resolution' (1999) 2(2) *ADR Bulletin* 17.

⁹⁴ Walker (n 95).

⁹⁵ Ibid.

cultural issues within the context of the hierarchical levels discussed. Moreover, the processes of intake and screening of participants; communication skills; and the ability to manage high emotions could present further examples of the application of the model and, potentially, advance a mediator's knowledge and skills.

Further, the hierarchical model of looking at an individual as a continuum has allowed us to systematise the concepts ranging from the most primitive parameters of a human being to the biosphere and integrate this knowledge within the mediation process. Ultimately, it is our view that holistic application and appreciation of these well- and not-so-well researched influences in the foundation of conflict, decision-making, communication, interpersonal relations and behaviour can be useful in the armamentarium of a competent mediation practitioner. Whilst we recognise that we do not always offer a way by which our research may be directly applied to the mediation practice, we believe that some elements of this knowledge could be utilised in both: mediator training and the mediation process itself. Some further research in this field could potentially assist in bridging the gap between bioscience and law.