

## Introduction

There is understandable attention being given to the relatively early-stage developments in neuroscience,<sup>1</sup> our study of the functioning of the human nervous system, and to the implications of neurological functioning for all areas of human experience and behavior. This is the new frontier, and we explore it upon the wide-spread and increasingly accepted assumption that we are embodied beings,<sup>2</sup> meaning that our experience of self and world and our behavioral responses and repertoire are determined and constrained by the functional dynamics of our physical bodies and, for the purposes of this book, particularly our nervous system and its central organ, the brain.<sup>3</sup> As Patricia Smith Churchland puts it, “The weight of evidence now implies that it is the *brain*, rather than some nonphysical stuff, that feels, thinks, and decides.” (Churchland, 2002, p. 1). In this view, consciousness isn’t separate from biology any more than solidity is separate from physics.<sup>4 5</sup>

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<sup>1</sup> What Churchland (1996) said more than 20 years ago continues to be true, “Although quite a lot is known at the cellular level, the fact remains that how real neural networks work and how their output properties depend on cellular properties still abounds with nontrivial mysteries. Naturally I do not wish to minimize the progress that has been made in neuroscience, but it is prudent to have a cautious assessment of what we really do not yet understand.”

<sup>2</sup> There is certainly not universal agreement with this perspective. See, as an example, Thomas Nagel’s *Mind and Cosmos: Why the Materialist Neo-Darwinian Conception of Nature Is Almost Certainly False*. Whether or not there is a “spiritual” essence separate from the body, we do know that neural mechanisms are key and fundamental to cognition and consciousness. We know this from the evidence of the consequences of brain injury and neurological disease to identity, cognition, and consciousness experience. The neural function and characteristics I present in this book don’t necessarily preclude or deny the disembodied perspective, nor are the conclusions and implications invalidated by a belief in the existence of a disembodied soul or spirit or self.

<sup>3</sup> What Gerald Edelman calls “brain-based epistemology” referring to efforts to ground the theory of knowledge and behavior in an understanding of how the brain works (Edelman, 2006. p. 2), a “theory of consciousness based on brain activity.” (Edelman, 2006. p. 9), and what Patricia Churchland calls “naturalized epistemology” (Churchland, 2002), and as Tucker and Luu (2012) state it, the “identity of neural structure and cognitive function.” (p. 208)

<sup>4</sup> To emphasize here, and as will be discussed further on, brains and consciousness do not exist in isolation. As Edelman puts it, “However, we emphatically do not identify consciousness in its full range as arising solely in the brain, since we believe that higher brain functions require interactions both with the world and with other persons.” (Edelman, 2000, p. xii)

<sup>5</sup> “Considering the new insights into the neural basis of psychological development, we will suggest that it is now possible to consider a single theory in which mind and brain are studied as the same process.” (Tucker et al, 2016, p. 1)

In the conflict resolution field, one of the fundamentals we've emphasized is that conflict is an unavoidable part of human social interaction, not a stain on the fabric of relationship but an inherent fiber woven into its fabric. As Jonathan Haidt puts it (with his focus being on conflicts that have to do with over-certainty, moralistic self-righteousness, what he terms "judgementalism," political and religious discord, and general for-and-against antagonisms), conflict behavior in our social relations "...is the normal human condition. It is a feature of our evolutionary design, not a bug or error that crept into minds that would otherwise be objective and rational." (Haidt, 2013, p. xx). Conflict is not so much something we do but rather something that we are. We've known this from observation. Sometimes with a sense of resignation, we have been led by history, current events, and our own personal experience to conclude that we can not prevent all conflict, that as human beings interact, conflict will inevitably arise. Conflict resolution professionals have wanted to normalize conflict as we've recognized its pervasive presence in human affairs and appreciated its informative potential for improving relationships and systems.

As theorists and practitioners, we've understood the importance of understanding the source of a conflict as a necessary diagnostic step preliminary to prevention or treatment. We've asked what it is in the circumstances of living that result in the types of conflicts we see and experience in our engagement with each other and that make many conflicts difficult to resolve?<sup>6</sup> We've tried to answer the question of cause, and not unsuccessfully, by identifying conditions that typically lead to conflict. We know, for example, that conflict will often result when there is competition over scarce resources, actual or perceived, or when power differentials are abused or

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<sup>6</sup> As James Crosswhite puts it in his book *Deep Rhetoric*, "What is it about human beings that prevents their gaining satisfactory knowledge, prevents them from reasoning in satisfactory ways? What goes wrong with human thinking in general?" (Crosswhite, 2013, p. 68)

even just present, or when access to data is unequal or the interpretation of data is inconsistent. We've identified that conflict may well erupt in the absence of procedural, relational, or substantive satisfaction (Moore, 2014) or in the absence of good communication skills. We've seen that structural elements of context can be a cause of relational conflict (Duggan, 1996). We know that differences in style and temperament can lead to conflict and that, indeed, diversity of all sorts, cultural and other, can cause friction and misunderstanding. We've described identity-based conflicts. We've been enlightened by relevant social psychological research that demonstrates many perceptual and behavioral tendencies that contribute to conflictual relations. These understandings are based on our observations of behavior and systems. But what is happening within the body and, more specifically, within the brain, the key determinant of our consciousness experience?

Our identification of sources of conflict has been more sociological or anthropological than neuroscientific. If we are indeed embodied beings, our conflict behaviors, will be determined by what is happening in the body, at the neural substrate of consciousness (Edelman, 2000).<sup>7</sup> As Fuster (2013) puts it, "Cognitive neuroscience is the neuroscience of what we know, which encompasses all our memories and everything we have learned since we were born. It deals with the mechanisms by which our brain acquires, stores, and retrieves knowledge. It deals also with the brain mechanisms that drive cognitive functions – that is, the functions by which we use knowledge in our daily interactions with others and the world around us: attention, perceptions, memory, language, and intelligence. Most importantly, cognitive neuroscience deals

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<sup>7</sup> "...epistemology should be grounded in biology, specifically in neuroscience." (Edelman, 2000, p. 207); "Complex psychological functions must arise from bodily structures. There is no other source for them." (Tucker, 2007, p. 218); "To find the mind, we must look to the body." (Tucker, 2007, p. 16); "The structure of a system at any time determines what it *can* experience." (Feldman, 2006, p. 72)

with the mechanisms by which our feelings and emotions influence every one of those functions.” (p. 58).<sup>8</sup>

Given that we are physical organisms and that it is brain function, rooted in the experience of the entire body in interaction with its environment,<sup>9</sup> that determines our conflict behaviors, it seems reasonable to conclude that advances in our neuroscientific understandings will impact the practice of conflict resolution just as, for example, advances in population genetics are impacting the disciplines of linguistics and anthropology.<sup>10</sup> Speaking about people who work with children, Louis Cozolino, in his *The Neuroscience of Human Relationships* (2014), makes a comment that I think applies equally to conflict workers. He says, “Parents, educators, and therapists – those of us who should be most concerned with shaping minds – have traditionally paid little attention to the brain. I have heard therapists say that psychotherapy is an art and that the brain is irrelevant to their work. I would respond, as with any art, that a thorough knowledge of our materials and methods can only enhance our skills and capabilities.” (p. xviii).

How might an understanding of the neural workings of the brain help us work more effectively with parties in conflict? This is the primary question this book asks. Is there a next phase in the development of conflict resolution practice that more explicitly takes into account the neural reality of our human communicational and relational experience? There are reasons to argue that the success of the conflict resolution field has not only been limited but has not

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<sup>8</sup> Fuster’s description here emphasizes the unity of or inseparable connection between thinking and feeling, logic and emotion, in cognition and consciousness. In agreement, I consider what is called “affective neuroscience” to be a subset within cognitive neuroscience, not a separate discipline.

<sup>9</sup> “...the personality is not a disembodied mental construct, but the individual’s unique pattern of brain development. To understand the epigenetic specification of the endophenotype -- the individual child -- it is necessary to consider not just the genetic coding for traits, but the full context of developmental self-regulation that shapes the growth of the brain and the personality within the complex social and cultural environment.” (Tucker et al, 2016, p. 3)

<sup>10</sup> For an interesting talk on this subject, see population geneticist David Reich’s talk at [http://edge.org/conversation/david\\_reichthe-genomic-ancient-dna-revolution](http://edge.org/conversation/david_reichthe-genomic-ancient-dna-revolution)

achieved its full promise. Some might respond by asking whether the idea of unreached promise is based on an unrealistic vision of what is possible, an idealistic overreach. But given the kinds and level of conflict we see in the world, it is understandable that we ask whether we can be more effective in helping people resolve differences nonviolently and collaboratively at all levels. Certainly we have been able to help individuals and groups meet in safe and well-structured processes to bridge divides, settle disputes, make decisions, and build agreements collaboratively, avoiding less satisfactory power- and rights-based alternatives that would, in many cases, produce less optimal outcomes. That said, for the most part, we work with self-selected parties who already favor, to one degree or another, a collaborative resolution of their dispute. Even within these circumstances, we see parties struggle to deal successfully with their differences, and we see them sometimes fail. Sometimes we see grudging settlements that are perceived as better than the alternatives but that fall short of “transformative” shifts in understanding that seem possible but beyond the parties’ reach and our ability, as practitioners, to facilitate. We also see the repeated emergence of unnecessary conflicts. We see parties unable to get to the table in the first place, unable to get sufficiently “outside” their conflict to see the possibility of working things out. We see political and policy differences degenerate into unproductive debate absent constructive joint learning. And we see long-standing, deeply destructive protracted conflicts in which parties are caught up in historical narratives they are unable to escape. If these shortcomings are rooted in the facts of our neurophysiology, are there ways that we can further develop practice to better take into account that reality?

As I mentioned earlier, we are in the early stages of exploration of the notably and exceptionally complex human nervous system,<sup>11</sup> the complexity of which allows for the

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<sup>11</sup> “Many gaps remain and much more must be accomplished in both neuroscience and psychology before a comprehensive picture of thought and knowledge can be glimpsed.” (Edelman, 2006. p. ix)

remarkable fullness and the subtle dimensions of our human experience. Much is being learned about brain chemistry and the role of hormones and neurotransmitters. Mapping of brain region function continues and we delve further into understanding synaptic behavior and cellular activity (Sapolsky, 2017). The project to understand the complexity of distributed neural functioning and dynamic brain structure that produces human cognition remains very much a work in progress, even as we add to our knowledge at an accelerating rate.<sup>12</sup> Though the technical details of our most recent advances in neuroscience lie outside the knowledge sphere of most of us,<sup>13</sup> there is a basic function of the human nervous system that can be described relatively simply and non-technically at a macro and conceptual level. We do know that, whatever the intricate and almost miraculous details, most of which are yet to be discovered and understood, our brains encode our perceptual experience in what Tucker (2007) calls "...the neural structures of experience..." (p. vii) to allow for what we term learning and memory, the very bases of consciousness, cognition, and identity.<sup>14</sup> Our ability to think, understand, know, believe, and, indeed, to have an identity, derives from and depends upon this basic neural function of encoding perceptual experience in neural structures and processes.<sup>15</sup> Our experiences of learning, remembering, knowing, thinking, understanding, believing, and identity are, in this

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<sup>12</sup> "Although some general points can be made about neuronal coding on the basis of available neurobiological data, many, *many* questions remain unresolved...Emphasizing this in-progress character of neuroscience is crucial, if a little daunting. At this stage in neuroscience, nothing like a well-established theory of neuronal coding exists." (Churchland, 2002, p. 289)

<sup>13</sup> For interesting and accessible discussions of some of the technical perspectives, see Tucker, 2007; Tucker and Luu, 2012; Feldman, 2006; Sapolsky, 2017. There are, of course, many other good sources.

<sup>14</sup> "We do not presently understand fully how this categorization is done but...we believe it arises through the selection of certain distributed patterns of neural activity as the brain interacts with the body and the environment." (Edelman, 2000, p. 48); "...underlying any conscious state...is a set of neural processes..." (Edelman, 2004, p. 116)

<sup>15</sup> "The macroscopic properties of mind and language arise...from the microscopic properties of neurons." (Feldman, 2006, p. 49); "My notion of personality is pretty simple: it's that your 'self,' the essence of who you are, reflects patterns of interconnectivity between neurons in your brain...Most of what the brain does is accomplished by synaptic transmission between neurons, and by calling upon the information encoded by past transmission across synapses." (LeDoux, 2003, p. 2)

view, identical with the encoding function of the brain, by which abiding neural structures, what might be called neural matrices of meaning, are created in response to perceptual experience.<sup>16</sup> And it is these cognitive processes of thinking, knowing, believing, feeling, understanding, meaning, and identity, embodied in our neural architecture, that are at the core of so much of our conflict relations. Conflict, at the most fundamental level, is based on how we perceive and understand the world external to ourselves, what meanings (stories) we assign or attribute to the objects of our perceptual experience (be they artifacts, individuals, or relational dynamics), what we believe to be true, real, or good in the world, how we think and what we think we know, and whom we experience ourselves and the other to be. At a very basic level, we fight over who we are. Differences involve identity. Identity is embodied.

We are perpetually negotiating our way through the day with each other, engaging, relating, communicating to get agreement on individual or group action, on how we will coordinate our behaviors as individuals influenced by and influencing the other. This is the social dance, whether in a restaurant deciding what to order and talking with the server, with children and spouse coordinating daily activities, in our working relationships, or even when we are just sitting together talking, just hanging out. The backdrop is agreement, negotiated agreement about what we are doing together, how we will be with each other, and what we believe to be true about the world. As soon as disagreement arises that puts into question what we're doing together, how we're doing it, or what we think to be true, conflict arises and we have to figure it out; we have to negotiate the next basis of relational stability. Whatever the manner we negotiate the relationship, whether through the manipulation or imposition of power or collaboratively, the

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<sup>16</sup> "...the properties of the mind depend fundamentally and in detail on the way the neural networks that are our brains carry out information processing." (Feldman, 2006, p. 58); "...ideas are held within brain tissue...neural connectivity implies psychological function..." (Tucker, 2007, p. v)

negotiation will be based on our understanding of the world, ourselves, and our relationship with the other. And those understandings exist in the brain's neural networks, the neural structures constructed and established in response to our perceptual experience of the world up to that point in time. Underlying the terms "reality constructs" and "identity formation" are actual neural structures formed in the physicality of our brains. Our stories are embodied, they exist in those structures or, rather, those structures are the stories.

The neural structures and processes of encoded perceptual experience have, as is true of all elements of the physical world, characteristics and limitations that will determine and constrain the experience and the functioning of the human organism of which they are such a critical part.<sup>17</sup> They will determine how we engage with the world and each other; they are the source, at a primary level, of our conflict experiences, and will help to explain why some conflicts are difficult to resolve, more or less, depending on the circumstances.

Certainly, there are other ways to think about, understand, and explain the presence of conflict in human social relations and the difficulties we so often face in resolving some conflicts or preventing their escalation. For example, research suggests that one of the reasons we have liberals and conservatives who battle so vociferously over issues of public policy is the presence of genetic variation in the population in which individuals have different genetic predispositions to be more or less reactive to threats, more or less receptive to change and new experience, and more or less risk averse, three fundamental personality traits that have been found to distinguish liberals and conservatives (Haidt, 2013).<sup>18</sup> Such diversity provides a fitness benefit to the

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<sup>17</sup> "Consciousness is a property of neural processes and cannot itself act causally in the world. As a process and an entailed property, consciousness arose during the evolution of complex neural networks with a specific kind of structure and dynamics." (Edelman, 2004, p. 141)

<sup>18</sup> Hood (2012, p. 51) reports on research that found generally that one in eight infants are born tending to respond fearfully to new situations (*inhibited*) and one in ten infants are born tending to be less fearful in response to new situations and more able to cope with uncertainty (*disinhibited*). The remaining babies lie somewhere along the

population as a whole, insuring checks and balances and a spectrum of survival strategies and possible responses to environmental challenges, but also results in conflict between the different personality types as they argue over public policy on the basis of their genetically-influenced preferences.

While it must be true that, if we are embodied beings, all cognitive experience will be based on the dynamics of neural physiology, our insights into conflict behavior needn't necessarily or always be based on direct reference to the biology of conflict experience. As I mentioned above, we've identified many sources of conflict and have proposed many useful theories on the basis of which we have developed effective ways of working with people in conflict. Further, within the realm of brain science, as we expand the frontier of our knowledge, we continue to learn about the roots of social behavior in the various and complex aspects of the body and brain structure and chemistry.<sup>19</sup> For example, research into the function of the vagus nerve and the entire vagal system is revealing their involvement in social communication, emotional engagement, and sympathetic arousal and modulation.<sup>20</sup> The quest to understand

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continuum between these two polarities. The temperament could be identified as early as four months and was predictive of personality seven years later.

<sup>19</sup> Many reviews have already been written of the roots of conflict behavior in brain structures (the hemispheres, prefrontal cortex, amygdala, hypothalamus, etc.) and neurochemicals (oxytocin, dopamine, serotonin, vasopressin, etc.) See, for example, Ken Cloke, *Bringing Oxytocin Into The Room: Notes On The Neurophysiology Of Conflict*, available at <http://www.mediate.com/articles/cloke8.cfm>; Richard Birke, *Neuroscience and Settlement: An Examination of Scientific Innovations and Practical Applications*, 25 OHIO ST. J. ON DISP. RESOL. 477 (2010); Lack, Jeremy and Bogacz, Francois. *The Neurophysiology of ADR and Process Design: A New Approach to Conflict Prevention and Resolution?* ABA 14th Annual Section of Dispute Resolution Spring Conference (2012); Weitz, Daniel. *The Brains Behind Mediation: Reflections on Neuroscience, Conflict Resolution and Decision-Making*, 12 CARDOZO J. CONFLICT RESOL. 471 (2011); Weitz, Daniel. *This is Your Brain on Mediation: What Neuroscience Can Add to the Practice of Mediation*, 4 NYSBA New York Dispute Resolution Lawyer 36 (2011); Fusting, Emily. *Making the Brain A Friend Not Foe: What Interventionists Should Know About Neuroscience*, 6 AM. J. MEDIATION 41 (2012); Goldman, William. *Mediation, Multiple Minds, and Managing the Negotiation Within*. 16 Harv. Negot. L. Rev. 297 (2011); Jill S. Tanz and Martha K. McClintock. *The Physiologic Stress Response During Mediation*, available at: <https://chicagomediationservices.com/wp-content/uploads/2017/04/The-Physiologic-Stress-Response-Published-Form.pdf>

<sup>20</sup> See Porges, Stephen. (2011). *The Polyvagal Theory: Neurophysiological Foundations of Emotion, Attachment, Communication and Self Regulation*, New York: W. W. Norton and Company; also Cozolino, (2014).

conflict in all its rich variety and to work with it effectively benefits from diverse paths of inquiry into the many features and circumstances of the complex human organism.

To emphasize, my focus here is on the very basic brain function of encoding perceptual experience that is the basis of learning, memory, cognition, and identity and that determines in a fundamental way the relational dynamics of interaction between and among us. Much of what is indicated or suggested by a review of the neural basis of consciousness confirms what we are already familiar with in theory and in informal observation of and social science research into our social behavior and our individual experience. By tying our folk psychology and our social science findings to the organism's neural processes, perhaps we might establish a solid stepping-stone from which to continue our efforts to better prevent, manage, and resolve the conflicts we witness and experience in our lives.<sup>21</sup> I offer the discussion in this book with the hope that it will stimulate some thinking about how an understanding of the neural basis of consciousness experience may lead to more robust and accurate theory development and to more effective practice interventions. As Don Tucker and Phan Luu (2012) put it, "The mind is the brain." How the brain works (informed by and integrated within the experience of the whole body) determines how the mind experiences self and other and how we behave in relationship.

A review of the many journal articles and books that have been written about conflict and conflict resolution reveals many different ways of looking at conflict behavior and how we can understand it in order to more effectively work with people in conflict. This is as it should be. There is not one right conceptual framework, no grand unified field theory that provides the

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<sup>21</sup> "Just as biology cannot be understood except in the light of evolution, psychology cannot be understood except in the light of brain development. Psychology is, indeed, in each moment, brain development." (Tucker and Luu, 2012, p. v.)

definitive, comprehensive perspective on the dynamics of conflict. My goal is to offer an additional way of thinking about the phenomena of our conflict experience.

To begin with, in Chapter I, I review some basic aspects of human experience to remind us of what underlies our day-to-day embodied consciousness. I then describe, in Chapter II, the neural encoding function of the brain that allows for or produces learning and memory that are the bases of cognition and identity, after which I highlight some key characteristics of the encoding function relevant to conflict work (Chapter III), before looking at how the characteristics of the neural encoding function can help us understand some of the dynamics of communication and relationship (Chapter IV). In Chapter V, I consider how this theoretical approach applies to various aspects of conflict resolution practice. This is where the rubber meets the road, so to speak. What are the opportunities and limitations that the neural perspective presents to conflict workers? Chapter VI presents a few ideas on how the theoretical framework might inform conflict resolution training. Finally, I offer some concluding thoughts in Chapter VII.

