



Rewiring the Brain for Peace:
Bridging Neuroscience, Spirituality, and Peacebuilding

WHITE PAPER:
KEY RESEARCH HYPOTHESES

March 30, 2017

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I. SUMMARY AND OBJECTIVES OF THE WHITE PAPER	3
II. INTRODUCTION	3
2.1. Project Summary	3
2.2. General objectives of the brainstorming phase of the project (2016-2017)	4
Mapping and bridging our understanding of the subfield at the intersection of neuroscience, spirituality, and peacebuilding	4
Helping identify actionable questions that can be further explored and researched through neuroscience and experimental psychology	4
2.3. Overview of our research agenda moving forward	5
III. FRAMING DEFINITIONS	6
Spirituality	6
Rituals	7
Values and Social-Emotional Intelligence	8
Peacebuilding	9
Trauma and Trauma Healing in Peacebuilding Contexts	9

Conclusion	10
IV. KEY RESEARCH AVENUES AND HYPOTHESES	11
Core Hypothesis	11
Sub-hypotheses	11
Hypothesis #1	12
Hypothesis #2	18
Hypothesis #3	22
Hypothesis #4	26
Hypothesis #5	29
Hypothesis #6	33
Hypothesis #7	37
V. SELECTED BIBLIOGRAPHY	40

I. SUMMARY AND OBJECTIVES OF THE WHITE PAPER

The original goal of the pilot phase of *Peace ReWire* (under the title “Rewiring the Brain for Peace: Bridging Neuroscience, Spirituality, and Peacebuilding”) was to illuminate how neuroscience research related to spirituality could inform work in peacebuilding and social change. More specifically, our foundational question asked how spiritual dimensions of human life influence individual and collective behaviors, and how they can help rewire the brain for peace.

Our project mobilizes an extraordinary community of top-level scientists, spiritual leaders, peacebuilding practitioners, and social change leaders from all over the world. We spent two years of rigorous transdisciplinary brainstorming and analyzing a vast body of existing research at the intersection of neuroscience, spirituality, and peacebuilding. This paper presents the consolidated results of these exchanges around seven key hypotheses. These hypotheses are organized gradually, moving from the more scientifically-documented in neuroscience to the more speculative. Key references are provided for each hypothesis based on our literature review.

This white paper is to be read in parallel with [the interactive literature mapping](#) accessible on the *Peace ReWire* website and other elements of our [research program](#) that were developed since then.

II. INTRODUCTION

2.1. Project Summary

As forces of hate, separation, and polarization surge around the world, we are offering a different path and a new hope for peace. *Peace ReWire* combines the power of neuroscience, spiritual and contemplative practices, and peacebuilding to **catalyze “inner peace,” and spark broad-scale social transformation.** We research the role that spiritual practices, rituals and values play **both *within the individual brain, and between large numbers of individuals*** – in short, **the alchemy of peace.**

To be sustainable, peace needs to go beyond a superficial shift in attitudes or belief systems. The **plasticity of the human brain** holds the promise of a **deeper personal transformation**, by allowing new associations to be formed **between internal states and action and changes in the environment.** This transformation can be achieved by **harnessing the power of deeply held spiritual and cultural practices that effectively help transform** anger, fear, and separation, **choose compassion, and make conscious change for peace.**

Peace ReWire is **developing the research** to back up that promise, and **translating the knowledge to inspire and support** individuals and communities around the world in undertaking a journey of inner and group transformation.

2.2. General objectives of the brainstorming phase of the project (2016-2017)

Mapping and bridging our understanding of the subfield at the intersection of neuroscience, spirituality, and peacebuilding

Within the different disciplines that study the brain, researchers have been exploring the interaction between contemplative practices (in particular mindfulness and other forms of meditation, yoga, and breathing techniques) and the human brain's plasticity. This project was seeking to expand upon the existing research and to explore:

- a. How a much wider diversity of spiritual rituals, experiences, and values present in different cultures around the world affects brain processes;
- b. How, and under which circumstances, these processes can contribute to the transformation of behaviors, attitudes, and relationships to prevent violence and restore peace after conflict, bridging into the peacebuilding field.

Helping identify actionable questions that can be further explored and researched through neuroscience and experimental psychology

The long-term objective is to learn from existing practices around the world, across cultures and belief systems, i.e. research how different types of spiritual rituals and values are actually employed, their impact on the human brain, and how they can, in turn, contribute to peacebuilding. The mid-term sub-objectives were:

- a. Develop a set of concrete case studies;
- b. Start documenting spiritual rituals and values as they relate to peacebuilding and bring a new way of measuring their impact, beyond usual common sense and assumptions, so that they can be considered more seriously as valid methods of intervention (to convince researchers, practitioners, and donors);
- c. Improve peacebuilding practices and develop methodologies to approach / incorporate such rituals and values into the work;
- d. Develop a long-term research agenda.

2.3. Overview of our research agenda moving forward

- Leadership of a new subfield, with the engagement of a new generation of neuroscientists;
- Substantial expansion of the literature database and interactive map (with additional functions on the map to make this tool even more interactive);
- Funding of research projects in new areas, including:
 - The neural basis for the development of **core values**, the behavioral consequences following disruption of those values in the face of violence and adversity, and the potential means to restore, or rewire, healthy core value brain circuits through cultural and spiritual practices;
 - The neural processes of **compassion** and how its deliberate practice works in high-stress or high-adversity situations to help **transform the traditional dilemma of in-group/out-group dynamics**; help ordinary citizens; overcome feeling emotionally overwhelmed and prevent negative reactions; and help **prevent burnout** for peacebuilders and activists working on the frontline of violence;
 - The specific neural or cognitive mechanisms associated with **ritualized experiences that support either the dissolution, or the reinforcement, of “us vs. them” thinking** (inter-group antagonisms).
- Ongoing documentation of a wide range of practices from around the world, analyzing their components, and mobilizing high-level multidisciplinary research teams to better understand the potential of these practices to rewire the brain for peace ([online database of world practices](#));
- Ongoing engagement with the research community to develop new research avenues and encourage more field research in diverse cultural settings.

III. FRAMING DEFINITIONS

Spirituality

In this project, our focus on spirituality more broadly, rather than religion specifically, reflects our intention to broaden traditional perspectives by presenting findings and drawing lessons that transcend particular religious groups and are relevant to a much wider audience. We also intend to call attention to the common spiritual elements found across different religious traditions, using them as a potential unifying starting point for

building better relations among potentially conflicting groups. We address spirituality (and consciousness) as it transcends the normal parameters of organized religion, suggesting a less bounded and, at times, more far-reaching scope of human involvement and human experience.¹ In many cases, it is about **humans searching for meaning and purpose**, and in particular, striving to redefine broad principles and moral beliefs during periods of transition.

Much debate surrounds the definition of both spirituality and religion. At times, these terms are used interchangeably. Some see religion as a manifestation of one's spirituality, yet a person can be spiritual without being religious. A person can also be outwardly "religious" in following certain rituals and other practices, and yet not focus on the underlying principles of spirituality. Generally, spirituality is used as a broader term, encompassing religion for some, but able to stand alone for others without attachment to a particular faith group or set of religious beliefs.² We acknowledge that spirituality is part of wider cultural systems that mediate both the violence and its impact, as well as community resilience during peacebuilding processes.³ It is a notion that is inherently heterogeneous, encompassing moving realities conceived in different meaning systems (i.e. cultures).

While we do not attempt to arrive at a consensual definition of spirituality, a few definitions may help us understand to what we are referring. As defined by Zinnbauer and Pargament, spirituality involves a **search for the sacred**, often occurring outside of traditional religious contexts. **Moral behavior** is very likely part of that search, but the search is often broader, including, for example, artistic endeavors, philosophic reading, and community involvement.⁴

In a medical context, Murray and Zentner have defined spirituality as:

... a quality that goes beyond religious affiliation, that strives for inspiration, reverence, awe, meaning and purpose, even in those who do not believe in God. The spiritual dimension tries to be in harmony with the universe, strives for answers about the infinite, and comes essentially into focus in times of

¹ Douglas Johnston, "Introduction: Beyond Power Politics," in *Religion, The Missing Dimension of Statecraft*, ed. Douglas Johnston and Cynthia Sampson (Oxford, New York: Oxford University Press, 1995).

² "Definitions and Discussion of Spirituality and Religion," *National Center for Cultural Competence*, accessed March 16, 2017, https://nccc.georgetown.edu/body_mind_spirit/definitions_spirituality_religion.html.

³ B Pouligny, "Resilience, Trauma and Violence, Flagship Study on Societal Dynamics and Fragility" (World Bank, 2010).

⁴ Brian J. Zinnbauer and K. I. Pargament, "Religiousness and Spirituality," in *Handbook of the Psychology of Religion and Spirituality, First Edition*, ed. Raymond F. Paloutzian and Crystal L. Park, 1 edition (New York: The Guilford Press, 2005).

emotional stress, physical (and mental) illness, loss, bereavement and death.⁵

Kaiser has defined spirituality as referring

to **a broad set of principles** that transcend all religions. Spirituality is about **the relationship between ourselves and something larger**. That something can be the good of the community or the people who are served by your agency or school or with energies greater than ourselves. Spirituality means **being in the right relationship with all that is**. It is a stance of harmlessness toward all living beings and an understanding of their mutual interdependence (emphasis added).⁶

A sense of **transcendence** is generally associated with the notion of spirituality. For Peterson and Seligman, spirituality refers to the idea that one's life fits **within a larger cosmic order or purpose**.⁷

This project also embraces a broad conception of **contemplative practices**, taking into account the forms they take across distinct traditions and cultures. These practices may include meditation, prayer, still and silent practices, time spent in nature, contemplative arts and movements, rituals, and ceremonies—all rooted in different religious or cultural traditions around the world. Our research also looks at practices that support reflection and engagement in a social context; in other words, the articulation of contemplative practices in promoting social justice.

Rituals

Ritual typically refers to a stereotyped and generally invariantly prescribed sequenced pattern of behaviors *that are designed to send a message to the other participant(s)*. All participants in the rituals have a general understanding of what they are doing, even if they don't always understand its deeper meaning (hence the variety of scripted, ceremonial and symbolic activities that happen in a certain sequence).⁸

In rituals, there is a sense of **predictability** in what is happening; people can then

⁵ Ruth Beckman Murray and Judith Proctor Zentner, *Nursing Concepts for Health Promotion*, 3rd edition edition (New York: Prentice-Hall, 1988).

⁶ L Kaiser, "Spirituality and the Physician Executive: Reconciling the Inner Self and the Business of Health Care," *The Physician Executive* 26, no. 2 (2000).

⁷ Christopher Peterson and Martin Seligman, *Character Strengths and Virtues: A Handbook and Classification*, 1 edition (Washington, DC : New York: American Psychological Association / Oxford University Press, 2004).

⁸ Suggested by Matt Rossano during the first subgroup meeting on June, 22, 2016. See more in Matt J. Rossano, *Mortal Rituals: What the Story of the Andes Survivors Tells Us About Human Evolution* (Columbia University Press, 2013); Matt J. Rossano, "Making Friends, Making Tools, and Making Symbols," *Current Anthropology* 51, no. S1 (2010): S89-98.

communicate with each other their intention more clearly and start building **trust**. Through the ritual, people learn how to build trust in their group. Rituals can be considered to lie on a **spectrum**: on one side of the spectrum, behaviors are becoming more focused and more predictable, which means that they are becoming more ritualized; on the other side, there is more spontaneity in the behaviors.

When looking at **spiritual rituals**, we want to look at stereotyped and sequenced patterns of behaviors that are common across religious traditions— even outside of specific traditions— and involve a search for sacredness as well as a sense of transcendence in the relationship with others and something larger. These elements could refer or lead to a broader purpose for the individual(s) concerned.

Values and Social-Emotional Intelligence

In sociology, values are considered as important and lasting beliefs or ideals shared by the members of a culture about what is good or bad and desirable or undesirable. At the individual level, we tend to see values as internalized social representations or moral beliefs that people appeal to as the ultimate rationale for their behaviors and actions. In other words, they are judgments about how important something is to the individual, priorities used to direct behavior and make choices.

Advances in cognitive science provide a more empirically grounded notion of the nature of values. They are mental processes that combine cognitive representations such as concepts, goals, and belief systems, with emotional attitudes that have positive or negative connotation. These operate in very concrete ways and can be studied as patterns of firing in populations of neurons. From this perspective, values are neural processes resulting from binding cognitive representations of concepts and beliefs together with emotions, that have major influence on a person's behavior, attitude, and serve as a guideline in their decision-making process.

Neuroscience therefore confirms the idea that these values are embodied and translate into a living practice and daily actions. These values connect with **social and emotional intelligence**, which is the ability to set and achieve goals, to tame our emotions, to delay gratification. These are skills that have to be built (unnaturally) and reinforced with modeling and practice.

Bringing spirituality into the mix, the project hypothesizes that there may be **core values**, commonly held by all human beings, across traditions, religions and cultures (for instance benevolence, compassion, etc.). These rely on a sense of transcendence in the relationship with others and something larger than oneself. We are asking how these values might contribute to rewiring the brain for peace, and how far this can be actively nurtured,

including in the most adverse circumstances.

Peacebuilding

Peacebuilding is not a consensual term, either. In this project, we understand the concept of peacebuilding as a comprehensive one “that encompasses, generates, and sustains the full array of processes, approaches, and stages needed to transform conflict toward more sustainable, peaceful relationships. Metaphorically, peace is seen not merely as a stage in time or a condition. It is a dynamic social construct.” This definition is from John Paul Lederach, a leading scholar in the field of peace studies. He also speaks of peacebuilding as “conflict transformation,” a term that signifies an ongoing, holistic and multi-faceted process of change from negative to positive relations, behavior, attitudes and structures.

Peace as an ecological process that is culturally and spiritually embedded

To be sustainable, peace needs to go beyond a superficial shift in attitudes or belief systems. The plasticity of the human brain enables this deeper personal transformation, by allowing new associations to be formed between internal states, action and changes in the environment. This process needs to be understood in an embodied cognitive science that approaches the brain holistically, understanding any behavior as part of a network comprised of three elements: the nervous system, the body, and its environment (society, culture, nature).

Trauma and Trauma Healing in Peacebuilding Contexts

Trauma healing is specifically addressed in this project as one crucial component of any peacebuilding process. The National Center for Trauma Informed Care (NCTIC) of the Substance Abuse and Mental Health Services Administration (SAMHSA) defines trauma as follows:

Individual trauma results from an event, series of events, or set of circumstances that is experienced by an individual as physically or emotionally harmful or life threatening and that has lasting adverse effects on the individual’s functioning and mental, physical, social, emotional, or spiritual well-being.

Following this definition, we understand trauma as being embedded in cultural and ecological systems that mediate the human experience; these meaning systems, in turn, provide resources for coping and making sense of these traumatic experiences. In other words, we approach trauma as grounded in human experience, in a close and dynamic relationship between the psychological aspects of human experience (thoughts, emotions, behaviors), and the wider social experience (relationships, traditions and culture). From this perspective, we acknowledge that trauma can be perceived in a diversity of ways. For

instance, in some contexts, trauma can be experienced as a collective affliction affecting not only the individuals concerned but also the groups to which they belong—and, in some cultures, not only the living but also the dead.

We also acknowledge that traumatic experiences can manifest in individual bodies in both obvious and subtle ways; for some, stressful situations can trigger pronounced and overt symptoms in some people, while others may suffer quietly and not even fully realize the on-going effects of their traumatic experience. There is wide variation in what becomes “overwhelming” or “unbearable” for those who have experienced trauma. As Daniel Levine notes, trauma is not a *disease* that can broadly diagnosed; it is fundamentally a state of *dis-ease*, and any form of trauma healing must navigate this on an individual basis.⁹

Trauma healing can be understood as a way to return people to “functioning” or, more broadly, to full psychosocial well-being (including psychological, social and cultural well-being). Health professionals have long tried to understand spirituality, acknowledging the role that spirituality (as a form of transcendence and connection) plays in patients’ bio-psychosocial well-being.¹⁰

Conclusion

By framing our conversation as being about spiritual rituals and values and how they can contribute to Rewiring the Brain for Peace, we highlight the fact that **peacebuilding based on spirituality goes beyond limited religious actors or inter-faith dialogues**. We also stress the importance of respecting the wide diversity of religious beliefs and practices (or absence thereof). The goal is not to identify one specific set of spiritual practices—such as meditation or yoga—or a specific set of values—such as forgiveness or compassion—as the best avenue for supporting peace. Instead we seek to promote a better understanding of how **the wide diversity of spiritual rituals and values** that are an integral part of different cultures and communities around the world affect brain processes and how, and under which circumstances, they can contribute to the transformation of behaviors, attitudes and relationships to support peace.

⁹ For a more complete discussion, see Peter A. Levine, *Healing Trauma* (Sounds True, 2008).

¹⁰ See also Alan B. Astrow, Christina M. Puchalski, and Daniel P. Sulmasy, “Religion, Spirituality, and Health Care: Social, Ethical, and Practical Considerations,” *The American Journal of Medicine* 110, no. 4 (2001): 283–87; J. Bown and S. Williams, “Spirituality in Nursing: A Review of the Literature,” *Journal of Advances in Health and Nursing Care* 2, no. 4 (1993): 41–66; Robert Coles, *The Spiritual Life of Children* (Boston: Houghton-Mifflin Co., 1990); Betty Davies et al., “Addressing Spirituality in Pediatric Hospice and Palliative Care,” *Journal of Palliative Care; Montreal* 18, no. 1 (Spring 2002): 59–67; Wanda K. Mohr, “Spiritual Issues in Psychiatric Care,” *Perspectives in Psychiatric Care; Madison* 42, no. 3 (2006): 174–83; Peter Speck, “The Meaning of Spirituality in Illness,” in *The Spiritual Challenge of Health Care, 1e*, ed. Mark Cobb and Vanessa Robshaw, 1 edition (Edinburgh: Churchill Livingstone, 1998).

IV. KEY RESEARCH AVENUES AND HYPOTHESES

Core Hypothesis (Brainstorming phase)

There are spiritual rituals, experiences, and values present in all cultures around the world that: (1) affect emotional and cognitive processes, (2) contribute to transforming behaviors, attitudes, and relationships, and (3) have the potential to facilitate peacebuilding processes.

Sub-hypotheses

Hypothesis #1

Mindful practices and rituals help self-regulate emotions, sculpt cognitive control, and refine explicit attentional and memory processes, thereby facilitating peacebuilding work under high-stress conditions.

Hypothesis #2

Collective rituals act as instruments for social bonding, providing a crucial basis for all dimensions of any peacebuilding process.

Hypothesis #3

Through predictability and safety, group rituals create a space to facilitate peacebuilding processes (including trauma healing).

Hypothesis #4

The transmission, consolidation or transformation of social norms through group rituals can shape human behaviors and promote values that are crucial for peace and the diffusion of violence.

Hypothesis #5

Certain values associated with spirituality can play a vital role in motivating individuals and groups to choose peaceful behaviors, move beyond human divisions, and bypass usual in-group/out-group dynamics.

Hypothesis #6

Certain types of deliberate intentional practices and rituals are essential in supporting the

alignment of individual behaviors and values.

Hypothesis #7

The experience of transcendence through spirituality gives individuals access to a wider sense of interconnectedness that goes beyond "self-other" dichotomies and which therefore may support overcoming psychologies that support violence and othering.

Hypothesis #1

Mindful practices and rituals help self-regulate emotions, sculpt cognitive control, and refine explicit attentional and memory processes, thereby facilitating peacebuilding work under high-stress conditions

Peacebuilders (ordinary citizens and professional peacebuilders) who are well-versed in mindful practices and rituals have the potential to show greater control over stress responses, improving their "performance" as peacebuilders.¹¹ There is a substantial body of research in psychology and neuroscience that can help support this hypothesis. The key neural structures/networks mostly concerned are: the hippocampal/Prefrontal Cortical Recurrent Networks, the insular/DLPFC/vmPFC/cingulate, the fronto-limbic networks, as well as the amygdala.

1.1. Individual and/or collective rituals can regulate stress-related biological responses through explicit top-down control over limbic networks

Focusing the mind – Ritual focuses attention on a chosen particular behavioral or sensory signal at the exclusion of other competing signals.¹² Generally speaking, by engaging in a rule-governed, predictable, routine-like behavior, one focuses the mind, and trains the mind to remain focused. Recent studies have shown that individuals well-versed in focused attention (i.e. long-term meditators) can volitionally decrease activity in the brain regions associated with mind-wandering and distraction.¹³ Further studies on individuals with high

¹¹ This process should be evidenced by neuroendocrine markers, i.e. cortisol, progesterone and all its derivatives/metabolites, Vasopressin/Oxytocin, inflammatory cytokines, etc.

¹² See Matt J. Rossano, "Ritual Behaviour and the Origins of Modern Cognition," *Cambridge Archaeological Journal*; Cambridge 19, no. 2 (2009): 243–56.

¹³ Kathleen A. Garrison et al., "Effortless Awareness: Using Real Time Neurofeedback to Investigate Correlates of Posterior Cingulate Cortex Activity in Meditators' Self-Report," *Frontiers in Human Neuroscience* 7 (2013); Kathleen A. Garrison et al., "Real-Time fMRI Links Subjective Experience with Brain Activity During Focused Attention," *NeuroImage* 81 (2013): 110–18; Kathleen A. Garrison et al., "Meditation Leads to Reduced Default Mode Network Activity Beyond an Active Task," *Cognitive, Affective, & Behavioral Neuroscience* 15, no. 3 (2015): 712–20.

levels of attentional control have demonstrated that long-term focused attention on the present moment produces changes in the brain regions associated with self-awareness, effectively dissociating the concept of self across time and the self in the present.¹⁴

Similar processes are at play for individual rituals as well as for group/collective rituals (or inter-personal rituals). People get less distracted during rituals; they can block out potential destructive thoughts and emotions more easily. Psychologists and neuroscientists working with high performance athletes, military personnel, and first responders, all stress the importance of ritualized activities to support people's focus before and during a "performance."¹⁵ Brain-imaging studies comparing novice sports players to experts have revealed significant differences in the brain areas activated during pre-performance routines.¹⁶ Specifically, "areas associated with emotions such as the posterior cingulate and the amygdala were significantly more active in novices, whereas the anterior cingulate along with areas in the temporal and parietal lobes were more active in experts."¹⁷ The authors of these studies argue that

these patterns indicate that the experts possess a superior ability to maintain attentional focus (as indicated by increased ACC activity) while inhibiting detrimental emotional responses (as indicated by significantly reduced response in the posterior cingulate and amygdala). Although not measured in the brain-imaging studies, a reasonable assumption would be that part of the experts' success is due to their ability to more effectively execute their pre-performance rituals compared to novices.¹⁸

Psychologists and neuroscientists working with extreme sport performers have anecdotally emphasized this effect, showing how, in desperate situations, individuals can be saved by going back to that ritualized space and focusing on a set of ritualized gestures

¹⁴ Norman A. S. Farb et al., "Attending to the Present: Mindfulness Meditation Reveals Distinct Neural Modes of Self-Reference," *Social Cognitive and Affective Neuroscience* 2, no. 4 (2007): 313–22.

¹⁵ "Thriving Under Adversity" (Red Bull High Performance Workshop, Santa Monica, CA, September 16, 2016).

¹⁶ J Kim, HM Lee, and WJ Kim, "Neural Correlates of Pre-Performance Routines in Expert and Novice Archers," *Neuroscience Letters* 445 (2008): 236–241; WF Gayton et al., "Effects of Preshot Routine on Free-Throw Shooting," *Perceptual and Motor Skills* 68 (1989): 317–318; SH Boutcher and DJ Crews, "The Effect of Preshot Attentional Routine on a Well-Learned Skill," *International Journal of Sport Psychology* 18 (1987): 30–39; Jon B. Millea, "The Effects of Removing the Free Throw Preshot Routine on Free Throw Success Rate" (M.S., Southwest Minnesota State University, 2011); DR Czech, AJ Ploszay, and KL Burke, "An Examination of the Maintenance of Preshot Routines in Basketball Free Throw Shooting," *Journal of Sport Behavior* 27, no. 323–329 (2004); DeAnn L. Lobmeyer and E. A., "Preliminaries to Free Throw Shooting: Superstitious Behavior?," *Journal of Sport Behavior* 9, no. 2 (1986): 70–78; John Milton et al., "The Mind of Expert Motor Performance Is Cool and Focused," *NeuroImage* 35, no. 2 (2007): 804–13; as quoted by Rossano.

¹⁷ Rossano, "Ritual Behaviour and the Origins of Modern Cognition," 251.

¹⁸ Ibid.

or words.¹⁹

Intention – The act of intention can have a particular impact on focusing the mind. Intention setting is central to any spiritual practice and is equally crucial in any ritualized activity, allowing the mind to focus on specific set of movements, words, or gestures. Again, it is interesting to note that sports coaches emphasize the importance of intention, and explicitly connect it to values (i.e. what do individual performers value the most in their lives, and how they connect a specific performance to that intention), with a strong spiritual component to it. Here we are referring mostly to one’s intention when engaging in a specific ritual. When the ritual has some collective dimensions, that individual intention may interact with the goals and purposes set by the group, which might be explicit or not, and understood differently by each individual (see Hypothesis 2 and Hypothesis 6 below). Intention in collective rituals thus has a strong emotional component that is linked to social cognition and awareness of the intentions of others.²⁰

Freeing space in the brain – Another effect of rituals is to free important space in the brain. In meditation practices, for instance, recent neuroimaging and EEG studies have shown consistent activation in the dorsolateral prefrontal cortex and anterior cingulate cortex—both regions critical to working memory and attention.²¹ Furthermore, studies have shown that meditative practices can produce long-term changes in both brain structure and attentional capacities, and that they increase levels of arginine vasopressin (AVP), which has important functions in learning and memory.²²

¹⁹ “Thriving Under Adversity.”

²⁰ Bruno Wicker et al., “Being the Target of Another’s Emotion: A PET Study,” *Neuropsychologia*, The cognitive neuroscience of social behavior, 41, no. 2 (2003): 139–46; Vittorio Gallese, “Intentional Attunement: A Neurophysiological Perspective on Social Cognition and Its Disruption in Autism,” *Brain Research*, Multiple Perspectives on the Psychological and Neural Bases of Understanding Other People’s Behavior, 1079, no. 1 (2006): 15–24.

²¹ S. W. Lazar et al., “Functional Brain Mapping of the Relaxation Response and Meditation,” *Neuroreport* 11, no. 7 (2000): 1581–85; Hans C. Lou et al., “A 15O-H2O PET Study of Meditation and the Resting State of Normal Consciousness,” *Human Brain Mapping* 7, no. 2 (1999): 98–105; Antoine Lutz et al., “Long-Term Meditators Self-Induce High-Amplitude Gamma Synchrony During Mental Practice,” *Proceedings of the National Academy of Sciences of the United States of America* 101, no. 46 (2004): 16369–73; Andrew Newberg et al., “The Measurement of Regional Cerebral Blood Flow During the Complex Cognitive Task of Meditation: A Preliminary SPECT Study,” *Psychiatry Research: Neuroimaging* 106, no. 2 (2001): 113–22; Robert Keith Wallace, Herbert Benson, and Archie F. Wilson, “A Wakeful Hypometabolic Physiologic State,” *American Journal of Physiology* 221, no. 3 (1971): 795–99.

²² OL Carter et al., “Meditation Alters Perceptual Rivalry in Buddhist Monks,” *Current Biology* 15 (2005); Sara W. Lazar et al., “Meditation Experience Is Associated with Increased Cortical Thickness,” *Neuroreport* 16, no. 17 (2005): 1893–97; Andrew Newberg, “Religious and Spiritual Practices: A Neurochemical Perspective,” in *Where God and Science Meet: How Brain and Evolutionary Studies Alter Our Understanding of Religion: Where God and Science Meet*, ed. Patrick McNamara, 1 edition (Westport, Conn: Praeger, 2006), 15–31; Heleen A. Slagter et al., “Mental Training Affects Distribution of Limited Brain Resources: e138,” *PLoS Biology* 5, no. 6 (2007): 1228–35.

As ritualized behaviors help free up working-memory capacity, which can then be allocated for greater inhibitory control, “one would predict that ritual improves performance under conditions of high-stress.”²³ There is evidence supporting this prediction in athletic performance, elite soldiers training, as well as academic performance for children diagnosed with ADHD. In athletic performance, a number of studies have demonstrated that ritual behavior, in the form of pre-performance routine, leads to better performance in a number of different sports.²⁴ Pre-performance routines serve to eliminate distractions, reduce anxiety and build confidence by focusing attention on a series of well-rehearsed, productive cues, and away from performance-disrupting thoughts.²⁵

1.2. Mind-body connections, particularly present in spiritual rituals, reinforce these effects and can act as an essential support to trauma healing processes in peacebuilding contexts

The role of breath – Breath plays an important role in many of the spiritual practices observed across cultures. The breath plays an important role in engaging and regulating the autonomic nervous system.²⁶ Many practices also involve the body very actively in movement, percussions, chanting, singing, etc. All these types of activities are helpful with the regulation of the nervous system. Recent studies have also shown significant links

²³ Rossano, “Ritual Behaviour and the Origins of Modern Cognition,” 251.

²⁴ Czech, Ploszay, and Burke, “An Examination of the Maintenance of Preshot Routines in Basketball Free Throw Shooting”; Gayton et al., “Effects of Preshot Routine on Free-Throw Shooting”; Lobmeyer and A, “Preliminaries to Free Throw Shooting”; Chris Lonsdale and Jimmy T. M. Tam, “On the Temporal and Behavioural Consistency of Pre-Performance Routines: An Intra-Individual Analysis of Elite Basketball Players’ Free Throw Shooting Accuracy,” *Journal of Sports Sciences* 26, no. 3 (2008): 259–66; D. Southard and B. Amos, “Rhythmicity and Preperformance Ritual: Stabilizing a Flexible System,” *Research Quarterly for Exercise and Sport* 67, no. 3 (1996): 288–96.

²⁵ Boutcher and Crews, “The Effect of Preshot Attentional Routine on a Well-Learned Skill”; Ronnie Lidor and Robert N. Singer, “Teaching Preperformance Routines to Beginners,” *Journal of Physical Education, Recreation & Dance*; *Reston* 71, no. 7 (2000): 34–36+; Robert Stephen Weinberg and Daniel Gould, *Foundations of Sport and Exercise Psychology* (Human Kinetics, 2003). As quoted by Rossano.

²⁶ Emma M. Seppala et al., “Loving-Kindness Meditation: A Tool to Improve Healthcare Provider Compassion, Resilience, and Patient Care,” *Journal of Compassionate Health Care* 1 (2014); Patricia L. Gerbarg et al., “The Effect of Breathing, Movement, and Meditation on Psychological and Physical Symptoms and Inflammatory Biomarkers in Inflammatory Bowel Disease: A Randomized Controlled Trial,” *Inflammatory Bowel Diseases* 21, no. 12 (December 2015): 2886–96; Ravinder Jerath et al., “Physiology of Long Pranayamic Breathing: Neural Respiratory Elements May Provide a Mechanism That Explains How Slow Deep Breathing Shifts the Autonomic Nervous System,” *Medical Hypotheses* 67, no. 3 (2006): 566–71; Anant Narayan Sinha, Desh Deepak, and Vimal Singh Gusain, “Assessment of the Effects of Pranayama/Alternate Nostril Breathing on the Parasympathetic Nervous System in Young Adults,” *Journal of Clinical and Diagnostic Research* 7, no. 5 (May 1, 2013): 821–23; Mian Zain Urfy and Jose I. Suarez, “Breathing and the Nervous System,” *Handbook of Clinical Neurology* 119 (January 1, 2014): 241; Atanu Roy and Sanjeev K. Singh, “Evaluation of Cardiovascular Autonomic Control in Chronic Pain Patients Using Isometric Handgrip and Deep Breath Maneuvers,” *National Journal of Physiology, Pharmacy and Pharmacology* 6, no. 5 (2016): 420–26; see also Dara G. Ghahremani, “Life Stress and Individual Differences in Effects of Breathing Meditation on Neural Markers of Emotion Regulation in Adolescents” (Mind and Life Institute: International Symposium for Contemplative Studies, San Diego, July 2016).

between the practice of mindful breathing and reductions in anxiety.²⁷ Intentional breathing has also been shown to be an effective intervention for depression among war veterans and battered women suffering from PTSD.²⁸

The mind-body connection – The importance of the mind-body connection has been particularly highlighted in trauma healing processes.²⁹ Within the different disciplines that study the brain, researchers have been exploring the interaction between contemplative practices (in particular mindfulness and other forms of meditation, yoga, and breathing techniques) the effect on memory, emotions, and chronic stress, with demonstrated effect, at times several months or even a year later.³⁰ Recent studies have also found that interoception (consciousness awareness of sensations and functions of the body) activates complex neural structures involving the insula, somatomotor and cingulate cortices, and that interoception can be strengthened through contemplative practice.³¹ Studies drawing on clinical observations from Somatic Experiencing Practitioners and their work with PTSD treatments, suggesting that bodily awareness through interoception can engage implicit memory and, by extension, can provide access to traumatic memories stored within the body.³²

Among the effects studied are the different ways to increase the activation of the parasympathetic system in the body (rest and digest system), as it is chronically underactivated in individuals who suffer from trauma (in comparison to the sympathetic

²⁷ Nupur Tiwari and David S. Baldwin, “Yogic Breathing Techniques in the Management of Anxiety and Depression: Systematic Review of Evidence of Efficacy and Presumed Mechanism of Action,” *Mind & Brain: The Journal of Psychiatry* 3, no. 1 (2012).

²⁸ Dana Dharmakaya Colgan et al., “The Body Scan and Mindful Breathing Among Veterans with PTSD: Type of Intervention Moderates the Relationship Between Changes in Mindfulness and Post-Treatment Depression,” *Mindfulness* 7, no. 2 (April 2016): 372–83, doi:10.1007/s12671-015-0453-0; Susan H. Franzblau et al., “A Preliminary Investigation of the Effects of Giving Testimony and Learning Yogic Breathing Techniques on Battered Women’s Feelings of Depression,” *Journal of Interpersonal Violence* 23, no. 12 (December 2008): 1800–1808.

²⁹ See for instance the work by Dr. Bessel Bessel A. van der Kolk, *The Body Keeps the Score: Brain, Mind, and Body in the Healing of Trauma*, Reprint edition (Penguin Books, 2015).

³⁰ Boris Bornemann et al., “Differential Changes in Self-Reported Aspects of Interoceptive Awareness Through 3 Months of Contemplative Training,” *Frontiers in Psychology* 5 (January 6, 2015); J. David Creswell et al., “Brief Mindfulness Meditation Training Alters Psychological and Neuroendocrine Responses to Social Evaluative Stress,” *Psychoneuroendocrinology* 44 (June 2014): 1–12; Claire Braboszcz et al., “Plasticity of Visual Attention in Isha Yoga Meditation Practitioners Before and After a 3-Month Retreat,” *Frontiers in Psychology* 4 (2013); Kaitlin N. Harkess et al., “Brief Report on the Psychophysiological Effects of a Yoga Intervention for Chronic Stress: Preliminary Findings,” *Journal of Psychophysiology*, July 27, 2016, 1–11.

³¹ Norman Farb et al., “Interoception, Contemplative Practice, and Health,” *Frontiers in Psychology* 6 (June 9, 2015).

³² Abi Blakeslee Kelleher, “Accessing Implicit Memory via Interoception: A Ground Theory Investigation of Somatic Experiencing Practitioners’ First-Person Experiences and Clinical Observations” (PhD Dissertation, Santa Barbara Graduate Institute, 2008).

system, i.e. the fight or flight reaction).³³ A few other studies have started to explore how contemplative practices might help relieve some of the traumatic symptoms,³⁴ but they have not necessarily explored the role of spirituality beyond considering its function as a placebo. Further study is needed into the role of spirituality as an integral part of therapy and trauma healing. Although these effects can contribute to bring “peace” not only to the individual but to the individual’s interaction with others.

1.3. Group rituals can allow a mix of social interaction and integrative self-reflection that contribute to enhance human cognition

Individual and collective dimensions of ritual – An interesting dimension of the conversation is the dialectic between individual and collective dimensions in rituals in the enhancement of human cognition. Social complexity and working-memory capacity have been directly connected in a study in which it was found that individuals with greater social engagement performed significantly better on tests of cognitive performance including working-memory capacity.³⁵ In another study, it was found that participants’ performance on tests used to measure wisdom improved significantly when they were allowed social collaboration, followed by integrative reflection (as opposed to just individual reflection). This was true even if the collaboration was entirely internal, that is, conversing with a wise “inner voice” (as is not uncommon in prayer).³⁶ This is consistent with research showing that social connections are important for healthy brain function; for instance, recent studies have shown that many specialized neural mechanisms have evolved specifically to process social information³⁷ and that overall cognitive function is impaired by extended social isolation.³⁸

This seems to be echoed by psychologists preparing high performers: ritualized group interaction and inner work (including self-awareness) seem to be equally important in rituals (both their impact as well as their formation, perpetuation or dissolution),³⁹ a balance that is not always fully acknowledged in peacebuilding interventions. This dialectic

³³ C.C. Streeter et al., “Effects of Yoga on the Autonomic Nervous System, Gamma-Aminobutyric-Acid, and Allostasis in Epilepsy, Depression, and Post-Traumatic Stress Disorder,” *Medical Hypotheses* 78, no. 5 (May 2012): 571–79.

³⁴ G. D. Jacobs, “The Physiology of Mind-Body Interactions: The Stress Response and the Relaxation Response,” *Journal of Alternative and Complementary Medicine (New York, N.Y.)* 7 Suppl 1 (2001): S83-92.

³⁵ Oscar Ybarra et al., “Mental Exercising Through Simple Socializing: Social Interaction Promotes General Cognitive Functioning,” *Personality and Social Psychology Bulletin* 34, no. 2 (February 1, 2008): 248–59.

³⁶ Rossano referring to PB Baltes and UM Staudinger, “Wisdom: A Metaheuristic (Pragmatic) to Orchestrate Mind and Virtue toward Excellence,” *American Psychologist* 55 (2000): 122–136.

³⁷ Thomas R. Insel and Russell D. Fernald, “How the Brain Processes Social Information: Searching for the Social Brain,” *Annual Review of Neuroscience* 27, no. 1 (July 2004): 697–722.

³⁸ John T. Cacioppo and Louise C. Hawkley, “Perceived Social Isolation and Cognition,” *Trends in Cognitive Sciences* 13, no. 10 (October 2009): 447–54.

³⁹ “Thriving Under Adversity.” and observations sent by Anna Christy (Red Bull High Performance Team / Hacking Creativity) about rituals and high performing talents.

between the individual and collective dimensions of rituals is particularly important in peacebuilding contexts. In many cultures, collective rituals occupy a central place in one's life. Even individual rituals are not as individual as one might think; if there is a spiritual dimension, the person concerned also approaches it as an interaction (and, in fact, some research has shown that the parts of the brain activated in such circumstances are very similar to the parts of the brain activated in human interactions).⁴⁰

One concrete experiment, which has not been done yet in contemplative studies, would be to compare individuals meditating by themselves and with others (is their brain activity different when meditating with others, or by themselves, or when they are aware that others are connected with them, for instance in the context of a global meditation day?). One could also compare (through EEG) the same person meditating by themselves vs. with a large group. This could be one dimension of a pilot study the project is hoping to conduct on the experience of the movement Saravadoya in Sri Lanka, where thousands of individuals from different traditions meet to meditate together.

Hypothesis #2

Collective rituals act as instruments for social bonding, providing a crucial basis for all dimensions of any peacebuilding process

Very little research has been done on brain functions due to group dynamics. Highly individualized inquiry is at the core of most contemplative studies--however, existing research in psychology and anthropology, as well as anecdotal evidence, lead to the hypothesis that **the protective mechanisms of deliberative practices and rituals can be extended from the individual to the group.**

2.1. Group rituals help facilitate social bonding

Ritual has a deep history of facilitating social bonding.⁴¹ As highly social animals, primates have an extensive range of social rituals designed to build trust, promote group harmony, and reinforce social relations.⁴² Ritual's effectiveness in building social relationships can be traced to two important functions in their case: (1) ritual focuses attention on a particular behavioral or sensory signal at the exclusion of other competing signals, and (2) ritual

⁴⁰ DP Fry, "Environment of Evolutionary Adaptedness, Rough and Tumble Play, and the Selection of Restraint in Human Aggression," in *Ancestral Landscapes in Human Evolution*, ed. D Narvaez (Oxford Press, 2014), 169–88..

⁴¹ Rossano, "Ritual Behaviour and the Origins of Modern Cognition."

⁴² Jane Goodall, *The Chimpanzees of Gombe: Patterns of Behavior* (Cambridge, Mass: Belknap Press, 1986); M.G.M. van Roosmalen and L.L. Klein, "The Spider Monkeys, Genus Ateles," in *Ecology and Behavior of Neotropical Primates*, ed. R.A. Mittermeier et al. (Washington, DC: World Wildlife Fund, 1988), 455–538; as quoted by Rossano.

inhibits pre-potent defensive responses long enough to allow social emotions and social-bonding mechanisms time to operate. For example, dominant female monkeys use certain vocalizations, grunts and gurneys, when approaching subordinates to signal them of non-threatening intentions, forestalling the subordinate's natural tendency to flee.⁴³

Looking across a range of traditional societies, three types of social rituals are common when it comes to enhancing in-group social cohesion and building between-group alliances: rituals of trust-building and reconciliation, rituals of initiation, and shamanistic rituals of community and individual healing. Similar rituals are happening in many post-conflict situations and have been reported to support community resilience.⁴⁴ Social bonding is an important component of what happens in those contexts.

Correlative evidence could be gathered to test the social bonding hypothesis in spiritual rituals: by measuring reactions to social stimuli and see if, after a ritual, participants react more to something that concerns a close relation versus a stranger, so building contrast and building a continuum.

Our hypothesis is that rituals contribute to **satisfy the need for belonging and interconnectedness, which can contribute to greater control over the stress response** (i.e. off-loading of stress into the group support network). In other words, group rituals can also inhibit pre-potent defensive responses long enough to allow social emotions and social-bonding mechanisms time to operate. A number of studies have demonstrated that social bonding is linked the production of oxytocin and vasopressin, both of which have been linked to the mitigation of stress responses.⁴⁵ Social-bonding could, in turn, support the development and practice of norms and values favoring peace.⁴⁶

2.2. Synchronous ritualistic activities can contribute to changing the patterns of social interaction and create out-group social rapport

From an evolutionary standpoint, most rituals are observed within a species or within a group with an understanding of how to communicate with each other; there is a common

⁴³ Rossano, "Ritual Behaviour and the Origins of Modern Cognition"; Joan B. Silk, "Grunts, Gurneys, and Good Intentions: The Origins of Strategic Commitment in Nonhuman Primates," in *Evolution and the Capacity for Commitment*. 2001, Pp. 138-57, 2001, 138-57.

⁴⁴ Pouligny, "Resilience, Trauma and Violence, Flagship Study on Societal Dynamics and Fragility."

⁴⁵ Paul J. Zak and Ahlam Fakhar, "Neuroactive Hormones and Interpersonal Trust: International Evidence," *Economics & Human Biology* 4, no. 3 (December 2006): 412-29; Anthony Charuvastra and Marylene Cloitre, "Social Bonds and Posttraumatic Stress Disorder," *Annual Review of Psychology* 59, no. 1 (2008): 301-28; Miranda Olf et al., "Social Support, Oxytocin, and PTSD," *European Journal of Psychotraumatology* 5, no. 0 (December 9, 2014).

⁴⁶ Ernst Fehr and Urs Fischbacher, "Social Norms and Human Cooperation," *Trends in Cognitive Sciences* 8, no. 4 (April 2004): 185-90.

language, common traditions, and everyone understands how the rituals work.⁴⁷ But group rituals can also inhibit pre-potent defensive responses (i.e. support self-mastery) long enough to allow social emotions and social-bonding mechanisms time to operate, thereby contributing to a transformation of the patterns and norms of social interaction, at times even allowing the creation of out-group social rapport.

One line of inquiry lies in **the relationship between synchronous activity (in particular synchronized movements) and social rapport**. Marching in step, chanting, dancing, playing music in unison, singing together and other synchronous ritualistic activities are found in all cultures and often play a crucial role in spiritual rituals. Some experiments have shown that rituals involving synchronous actions are adaptive in increasing rapport between group members, the sense of empathy and perception of similarity among participants, and promoting social cooperative behavior.⁴⁸

Another line of inquiry explores the role of synchronized group movements in creating a sense that individuals are part of a larger social whole. Recent studies have explored the process of 'identity fusion,' whereby participants in collective rituals experience a fusing of the personal and social self and, as a result, feel a sense of combined agency and a strong motivation towards pro-group behavior.⁴⁹ These studies echo similar findings that group rituals have a tendency to promote cooperation among participants,⁵⁰ and that the process of activating mirror neurons through mimicry (an essential act in synchronous group ritual) has long-lasting effects on prosocial behavior after the period of mimicking has

⁴⁷ For an illustration of how ritual participation enhances the social bonds that connect its participants, see R. Sosis and B. Ruffle, "Religious Ritual and Cooperation: Testing for a Relationship on Israeli Religious and Secular Kibbutzim," *Current Anthropology* 44 (2003): 713–722.

⁴⁸ Piercarlo Valdesolo, Jennifer Ouyang, and David DeSteno, "The Rhythm of Joint Action: Synchrony Promotes Cooperative Ability," *Journal of Experimental Social Psychology* 46, no. 4 (July 2010): 693–95; Dimitris Xygalatas et al., "Extreme Rituals Promote Prosociality," *Psychological Science* 24, no. 8 (August 1, 2013): 1602–5; Ronald Fischer et al., "How Do Rituals Affect Cooperation?: An Experimental Field Study Comparing Nine Ritual Types," *Human Nature* 24, no. 2 (June 2013): 115–25; Paul Reddish, Ronald Fischer, and Joseph Bulbulia, "Let's Dance Together: Synchrony, Shared Intentionality and Cooperation," *PLOS ONE* 8, no. 8 (August 7, 2013); Frank J. Bernieri, "Coordinated Movement in Human Interaction: Synchrony, Posture Similarity, and Rapport" (Psychology, Harvard, 1988); Russell A. Isabella, Jay Belsky, and Alexander von Eye, "Origins of Infant-Mother Attachment: An Examination of Interactional Synchrony during the Infant's First Year," *Developmental Psychology* 25, no. 1 (1989): 12; Lynden K. Miles, Louise K. Nind, and C. Neil Macrae, "The Rhythm of Rapport: Interpersonal Synchrony and Social Perception," *Journal of Experimental Social Psychology* 45, no. 3 (May 2009): 585–89; A. R. Radcliffe-Brown, *The Andaman Islanders: A Study in Social Anthropology* (New York: Free Press, 1922); Scott S. Wiltermuth and Chip Heath, "Synchrony and Cooperation," *Psychological Science* 20, no. 1 (2009): 1–5.

⁴⁹ William B. Swann et al., "Identity Fusion: The Interplay of Personal and Social Identities in Extreme Group Behavior," *Journal of Personality and Social Psychology* 96, no. 5 (2009): 995–1011; William B. Swann et al., "When Group Membership Gets Personal: A Theory of Identity Fusion," *Psychological Review* 119, no. 3 (2012): 441–56.

⁵⁰ Ronald Fischer et al., "How Do Rituals Affect Cooperation?: An Experimental Field Study Comparing Nine Ritual Types," *Human Nature* 24, no. 2 (June 2013): 115–25.

ceased.⁵¹ In one study involving an elite college rowing team, it was found that synchronous movement and identity fusion can elevate the pain threshold and generate shared euphoric experiences amongst the participants.⁵² Generally speaking, activating mirror neurons contributes to the development of a greater ability to mentalize (understood as the ability to read the mental states of other agents) which, in turn, increases trust and cooperation, two crucial intangible dimensions for peacebuilding.⁵³

It is important to note that synchronous movement and collective ritual not only yield a higher tendency towards prosocial behavior among co-performers, but can also increase prosociality towards non-performers and outgroup members as well.⁵⁴ Research on a fire-walking ritual in a small Spanish village takes this one step further by looking at synchronized arousal between performers and spectators, even in the absence of synchronized action.⁵⁵ Synchronized arousal is here related to empathy (the capacity of an individual to feel what another is feeling) and affective mirroring.⁵⁶ Research in neuroscience has documented empathy by showing highly similar patterns of brain activity present in an observer as in the observed actor who has the first-hand experience of the emotion (in particular if the feeling is pain).⁵⁷ In the fire-walking ritual, raw pulse data revealed striking qualitative similarities during the ritual between the heart rates of fire-walkers and heart rates of relatives and friends, with no apparent similarity to non-related spectators; this finding is confirmed in a similar study conducted on collective Hindu firewalking ritual in Mauritius.⁵⁸ In that case, the results show a synchronization of biological fundamentals, and also suggest that the collective ritual experience was mediated by familiarity. Other studies have also demonstrated empathy as limited to close

⁵¹ Rick B. Van Baaren et al., "Mimicry and Prosocial Behavior," *Psychological Science* 15, no. 1 (January 2004): 71–74.

⁵² Emma E.A. Cohen et al., "Rowers' High: Behavioral Synchrony Is Correlated with Elevated Pain Thresholds," *Biology Letters* 6 (2010): 106–108.

⁵³ Anne-Kathrin J. Fett et al., "Default Distrust? An fMRI Investigation of the Neural Development of Trust and Cooperation," *Social Cognitive and Affective Neuroscience* 9, no. 4 (2014): 395–402.

⁵⁴ Paul Reddish et al., "Collective Synchrony Increases Prosociality Towards Non-Performers and Outgroup Members," *British Journal of Social Psychology* 55, no. 4 (2016): 722–38.

⁵⁵ Ivana Konvalinka et al., "Synchronized Arousal Between Performers and Related Spectators in a Fire-Walking Ritual," *Proceedings of the National Academy of Sciences of the United States of America* 108, no. 20 (2011): 8514–19.

⁵⁶ CS Alcorta and R Sosis, "Ritual, Emotion, and Sacred Symbols: The Evolution of Religion as an Adaptive Complex," *Human Nature* 16 (2005): 323–359; R.W. Levenson, "Human Emotions: A Functional View," in *The Nature of Emotion: Fundamental Questions*, ed. Paul Ekman and Richard J. Davidson, 1 edition (New York: Oxford University Press, 1994).

⁵⁷ F de Vignemont and T Singer, "The Empathic Brain: How, When and Why?," *Trends in Cognitive Science* 10 (2006): 435–441; Tania Singer and Claus Lamm, "The Social Neuroscience of Empathy," *Annals of the New York Academy of Sciences* 1156, no. 1 (March 2009): 81–96.

⁵⁸ Ronald Fischer et al., "The Fire-Walker's High: Affect and Physiological Responses in an Extreme Collective Ritual," ed. Brock Bastian, *PLoS ONE* 9, no. 2 (February 20, 2014).

others and, without active effort, not necessarily available for outgroup individuals.⁵⁹ Finally, empathy is mediated by culture, hence potential variation in intergroup relations.⁶⁰

For our project, we may want to expand the experiments to other scenarios, in particular to people who are not necessarily strangers, but are in conflict together or have a history together. How much could a ritual contribute to create rapport? And how much could this translate into their attitudes and behaviors?

Another line of study would be to identify and more closely study existing ritual practices in different religious traditions that promote within-group healing and reconciliation, and then study their applicability in broader contexts.

Hypothesis #3

Through predictability and safety, group rituals create a space to facilitate peacebuilding processes (including trauma healing)

3.1. Rituals provide predictability in terms of familiar forms and roles for the participants, providing a sense of relaxation

Predictability is an essential feature of the brain. The brain constantly tries to predict the world and minimize cost; so in order to minimize the cost, and in order to save efforts (not having to encode new things all the time, as the brain takes more time and more energy to process something that is new), the healthy brain primarily bases its work on predictability, not reactivity. Therefore, emotions in the brain can be seen as a function of how predictable a situation is.⁶¹ Indeed, in theory, predictability is relaxing and stress free to the brain (reducing stress hormones such cortisol and epinephrine/norepinephrine).

The idea of predictability is a key characteristic of rituals, even though rituals might fall on a spectrum between predictability and spontaneity. The more predictable behaviors are in a collective setting, the more ritualized they become. The predictable structure and well-defined roles within a ritual allows the brain to relax, allowing the individuals to settle peacefully into themselves as well as the group dynamics. This sense of relaxation enables

⁵⁹ Jennifer N. Gutsell and Michael Inzlicht, "Empathy Constrained: Prejudice Predicts Reduced Mental Simulation of Actions During Observation of Outgroups," *Journal of Experimental Social Psychology* 46, no. 5 (September 2010): 841–45.

⁶⁰ Bobby K. Cheon et al., "Cultural Influences on Neural Basis of Intergroup Empathy," *NeuroImage* 57, no. 2 (July 15, 2011): 642–50.

⁶¹ For a short presentation of the argument, see Lisa Feldman Barrett, "The Predictive Brain," <https://www.edge.org/response-detail/26707>. See also Barrett's Lab Interdisciplinary Affective Science Laboratory at Northeastern: <http://www.affective-science.org>

a feeling of safety, which can help the brain cope with stressful situations and also allow it to explore new perspectives and ideas, as well as expand some of their moral behaviors, beyond their group limits. For instance, under stress (as measured by cortisol level), people tend to be generous only to the people they already know; there seems to be a correlation between cortisone level and the amount of generosity, or “emotional contagion” (a phenomenon thought to be related to empathy and probably compassion).⁶² The hypothesis is that the reduction of stress through a shared ritualized experience could contribute to reversing the impact.

In addition to predictability, rituals can also contain an element of surprise and novelty, which activates the reward center of the brain and allows for new information to be presented within the safe space created by the familiar roles and forms within the ritual. A significant part of the literature in neuroscience and neuropsychology addresses that element of **novelty**.⁶³ We know that the brain likes to be efficient in predicting what is going to happen in, or the implications of, a particular situation. However, novelty can also be rewarded, as it generally involves a release of dopamine in the basal ganglia (the reward center of the brain), a neurochemical in the brain that, because it acts as a reward, is important for learning. When we encounter a new situation, especially if it is rewarding or arousing in some way, neurons activate to release dopamine. We know that, over time, those neurons actually activate to predict what is going to happen, so when they see cues in the environment that are predictive of later rewards, those neurons are also activated (much like in the famous Pavlov’s dogs experiment). In a sense, it means that neurons are then also coding for predictability. It also means that one can use surprise and novelty only to a certain point, as the brain can also get used to the proportion of surprise; people change their prediction based on the event. In order to maintain an element of surprise, one really needs to go beyond what individuals are used to.

⁶² Singer and Lamm, “The Social Neuroscience of Empathy”; Joan Y. Chiao and Vani A. Mathur, “Intergroup Empathy: How Does Race Affect Empathic Neural Responses?,” *Current Biology* 20, no. 11 (June 8, 2010).

⁶³ S. Raj and K. R. Daffner, “Neural Networks Underlying Novelty Processing,” in *Brain Mapping* (Waltham: Academic Press, 2015), 613–18; J. Schomaker and M. Meeter, “Short-and-Long-Lasting Consequences of Novelty, Deviance and Surprise on Brain and Cognition,” *Neuroscience & Biobehavioral Reviews* 55 (August 2015): 268–79; Ruth M. Krebs et al., “The Novelty Exploration Bonus and Its Attentional Modulation,” *Neuropsychologia*, Episodic Memory and the Brain, 47, no. 11 (September 2009): 2272–81; R. M. Krebs et al., “Novelty Increases the Mesolimbic Functional Connectivity of the Substantia Nigra/Ventral Segmental Area (SN/VTA) during Reward Anticipation: Evidence from High-Resolution fMRI,” *NeuroImage* 58, no. 2 (September 15, 2011): 647–55; Jennifer Urbano Blackford et al., “A Unique Role for the Human Amygdala in Novelty Detection,” *NeuroImage* 50, no. 3 (April 15, 2010): 1188–93; Mariann R. Weierich et al., “Novelty as a Dimension in the Affective Brain,” *NeuroImage* 49, no. 3 (February 1, 2010): 2871–78; Furong Huang, Jin Fan, and Jing Luo, “The Neural Basis of Novelty and Appropriateness in Processing of Creative Chunk Decomposition,” *NeuroImage* 113 (June 2015): 122–32; Vishnu P. Murty, Kevin S. LaBar, and R. Alison Adcock, “Distinct Medial Temporal Networks Encode Surprise During Motivation by Reward Versus Punishment,” *Neurobiology of Learning and Memory* 134 (October 2016): 55–64.

There is a crucial difference in whether the surprise has a positive or negative valence, i.e. whether a positive memory or a threatening, traumatic one, is triggered, something that might prove difficult to anticipate. Generally speaking, a sense of safety (and familiarity) may need to be built first, especially in stressful situations. This means that a balance is probably needed. Once one feels in a safe environment, the human brain has a tendency to explore. However, human beings generally don't look for new things all the time. The proportion of new things to known things can be crucial. For instance, the Outward Bound Peacebuilding programs take participants in the outdoors in an unfamiliar environment that is physically challenging, with a completely new social group, intentionally creating a level of stress and dissonance.⁶⁴ However, this is done with a group of strangers that is quickly and effectively moved from a group to a team via team building, trust and rapport building initiatives. And rituals are used in that context as a tool for creating predictability.

Assessing when greater predictability or greater novelty in ritual activity can promote cooperation or when it might insight conflict is a line of inquiry important in peacebuilding contexts. An important question, in that context, is who is bringing the element of novelty. In peacebuilding contexts, people often report that they are used to foreigners/outsideers doing weird things, so outsideers proposing a ritual, or element of ritual, completely novel, may not necessarily produce the same hit of dopamine if they either analyze it as "outsideers doing their usual things" or keep themselves at a symbolic distance; in both cases, they might not be really engaged in the event.

3.2. Rituals provide a sense of safety that can allow for the suspension of the fight/flight response and can ease the stigma around traumatic experiences

Safety is both a crucial component and a by-product of rituals. Ritualized activities can help build that symbolic safe space for individuals and groups. That sense of safety and trust in the process is important for the brain to be able to process things. For high performers, rituals have been observed as insuring a sense of security, control and consistency that helps people feel safe even when exposed to extreme adverse conditions, including facing the possibility of their own death.⁶⁵ Of course, each individual may approach and assess that sense of safety differently; but the hypothesis is that, by assessing different experiences, and looking for those elements comparatively, it might be possible to identify a number of components necessary to ensure that minimum safeness for individuals to

⁶⁴ Victor Walsh and Gerald Golins, "The Exploration of the Outward Bound Process" (Colorado Outward Bound School, Denver, January 1976); Brad Daniel, "The Life Significance of a Spiritually Oriented, Outward Bound-Type Wilderness Expedition," *Journal of Experiential Education* 29, no. 3 (2007): 386-89; Kenneth R. Kalisch, Andrew J. Bobilya, and Brad Daniel, "The Outward Bound Solo: A Study of Participants' Perceptions," *Journal of Experiential Education* 34, no. 1 (January 1, 2011): 1-18; Mike Brown, "Comfort Zone: Model or Metaphor?," *Australian Journal of Outdoor Education* 12, no. 1 (2008).

⁶⁵ "Thriving Under Adversity." And observations sent by Anna Christy (Red Bull High Performance Team / Hacking Creativity) about rituals and high performing talents.

engage and for a transformation to happen.

Initiation rituals in traditional societies can be interesting to observe in that perspective: they can be traumatic and stressful, and often are physically very challenging, as they are meant to support a drastic life transition. But, in many cases, there is a cultural knowledge, which is sacred, that is taken seriously as it can enlighten an individual, change their understanding about who they are and how they relate to others. There is a trust in that knowledge; the teacher (or facilitator) often embodies it. This is what can create enough safety for the individual to fully enter the space, and trust the process.

Being in a safe environment – feeling safe – is a particularly important dimension for individuals suffering from trauma, and an important reason why we want to activate the parasympathetic nervous system. For instance, victims and survivors of torture often live in constant state of danger, with their flight or fight response always on. Being in a group that feels safe can also be important; this is something that could be at play in the case of Alcoholics Anonymous groups, and that also seems to be playing a role in a number of traditional ceremonies studied outside of the Western world.⁶⁶ The reintroduction of some rituals can contribute to giving the individuals back a sense of control as they find a space when they can feel safe.

In group settings, ceremonies may give individual suffering a space (both symbolic and physical) in the community, so that survivors can come to terms with that feeling of being “lost”,⁶⁷ a feeling that may be reinforced when they are confronted with forms of healing and medicine that they don’t understand.⁶⁸ This is sometimes framed as a form of collective acknowledgement and validation of the trauma, as well as of the individual experiences and the narratives attached to them.⁶⁹ It tells victims and survivors that the community/society values their humanity and recognizes the tragedy of what has occurred. It might be a way to honor them, even at times to allow the survivors and victims’ relatives to engage in a mourning process. This dimension can be particularly important for individuals who may

⁶⁶ “Exploring community and society resilience mechanisms” in Pouligny, “Resilience, Trauma and Violence, Flagship Study on Societal Dynamics and Fragility.”

⁶⁷ John Paul Lederach, “Resiliency and Healthy Communities: An Exploration of Image and Metaphor,” in *Community Resilience: A Cross-Cultural Study* (Washington, DC: Fetzer Institute, Woodrow Wilson International Center for Scholars, 2010).

⁶⁸ B. J. Good et al., “Psychosocial Needs Assessment of Communities Affected by the Conflicts in the Districts of Pidie, Biereuen, and Aceh Utara,” Report (International Organization for Migration, 2006), <https://researchspace.auckland.ac.nz/handle/2292/26742>.

⁶⁹ J. Hubbard and N. Pearson, “Sierra Leonean Refugees in Guinea,” in *The Mental Health of Refugees*, ed. K. Miller and L. Rasco (Upper Saddle River, NJ: Erlbaum, 2004), 95–132; Leila Gupta and Catherine Zimmer, “Psychosocial Intervention for War-Affected Children in Sierra Leone,” *The British Journal of Psychiatry* 192, no. 3 (March 1, 2008): 212–16; Shanee Stepakoff et al., “Trauma Healing in Refugee Camps in Guinea: A Psychosocial Program for Liberian and Sierra Leonean Survivors of Torture and War,” *American Psychologist* 61, no. 8 (2006): 921–32.

be stigmatized: rituals acknowledge their suffering and the cleansing component of the rituals support them in gaining community acceptance, prompting in some cases the mobilization of community elders to provide additional protection. The sense of 'space' is also constituted by the time spent by healers with patients, including before and after the ceremonies, a sharp contrast with what people may feel about the way they are rushed by modern medicine.⁷⁰

Hypothesis #4

The transmission, consolidation or transformation of social norms through group rituals can shape human behaviors and promote values that are crucial for peace and the diffusion of violence

4.1. Rituals play an essential role in the transmission and reinforcement of social norms; they can also support change by contributing to the transformation and 'refreshing' of those norms

Rituals play an essential role in the transmission and reinforcement of social norms that shape human behaviors.⁷¹ A whole host of literature on game theory and neuroscience also demonstrates the role of rituals in promoting certain types of social norms.⁷² For instance,

⁷⁰ Good et al., "Psychosocial Needs Assessment of Communities Affected by the Conflicts in the Districts of Pidie, Biereuen, and Aceh Utara"; Astier M. Almedom, "Factors That Mitigate War-Induced Anxiety and Mental Distress," *Journal of Biosocial Science; Cambridge* 36, no. 4 (July 2004): 445–61; Stevan E. Hobfoll et al., "Five Essential Elements of Immediate and Mid-Term Mass Trauma Intervention: Empirical Evidence," *Psychiatry* 70, no. 4 (2007): 283-315; discussion 316-369; Maurice Eisenbruch, "The Ritual Space of Patients and Traditional Healers in Cambodia," *Bulletin de l'Ecole française d'Extrême-Orient* 79, no. 2 (1992): 283–316.

⁷¹ Matt J. Rossano, "The Essential Role of Ritual in the Transmission and Reinforcement of Social Norms," *Psychological Bulletin* 138, no. 3 (2012): 529–49.

⁷² Alan G. Sanfey, "Social Decision-Making: Insights from Game Theory and Neuroscience," *Science* 318, no. 5850 (October 26, 2007): 598–602; Daeyeol Lee, "Game Theory and Neural Basis of Social Decision Making," *Nature Neuroscience* 11, no. 4 (April 2008): 404–9; Peter Railton, "Moral Learning: Why Learning? Why Moral? And Why Now?," *Cognition*, (2016); James K. Rilling et al., "A Neural Basis for Social Cooperation," *Neuron* 35, no. 2 (July 2002): 395–405; Carolyn H. Declerck, Christophe Boone, and Griet Emonds, "When Do People Cooperate? The Neuroeconomics of Prosocial Decision Making," *Brain and Cognition* 81, no. 1 (February 2013): 95–117; Fett et al., "Default Distrust?"; Juan A. Lacombe et al., "Decisiveness, Peace, and Inequality in Games of Conflict," *Journal of Economic Psychology*, 2016; Jeffrey R. Stevens, Fiery A. Cushman, and Marc D. Hauser, "Evolving the Psychological Mechanisms for Cooperation," *Annual Review of Ecology, Evolution, and Systematics* 36, no. 1 (2005): 499–518; Frank Krueger et al., "Neural Correlates of Trust," *Proceedings of the National Academy of Sciences* 104, no. 50 (December 11, 2007): 20084–89; Shinsuke Suzuki et al., "Neural Basis of Conditional Cooperation," *Social Cognitive and Affective Neuroscience* 6, no. 3 (June 1, 2011): 338–47; Paul J. Zak, Robert Kurzban, and William T. Matzner, "Oxytocin Is Associated with Human Trustworthiness," *Hormones and Behavior* 48, no. 5 (December 2005): 522–27; Francesco Guala, "Reciprocity: Weak or Strong? What Punishment Experiments Do (and Do Not) Demonstrate," *Behavioral and Brain Sciences* 35, no. 01 (February 2012): 1–15; Susanne Leiberg, Olga Klimecki, and Tania Singer, "Short-Term Compassion Training Increases Prosocial Behavior in a Newly Developed Prosocial Game," ed. Antonio Verdejo García, *PLoS ONE* 6, no. 3 (March 9, 2011); Paul AM Van Lange and Niels J Van Doesum, "Social

the Ultimatum Game experiments have provided ample insights into the role of rituals in promoting altruism, social norm violations, generosity, and cooperation.⁷³ Experiments using the Public Goods Game show similar results with the values of cooperation, sharing, and trust.⁷⁴ The neural systems involved are similar in nature to those involved in the emotional self-regulation processes facilitated by rituals (hypothesis #1: Insular/DLPFC/vmPFC/OFC/Cingulate; fronto-limbic networks, amygdala).

At the same time, rituals can also be viewed as a way to create change, to transform (or even re-interpret) norms, perceptions and behaviors. Rituals of reintegration and healing in post-war contexts, for instance, generally include both the re-affirmation of collective rules and their reinterpretation.⁷⁵ Stanford's research on compassion show the possibility of breakthrough moments to support a change that then need to be maintained/sustained through rituals and other practices to allow a durable impact.⁷⁶ Harvey Whitehouse's distinction between **doctrinal and imagistic rituals** provides an interesting insight into how different types of rituals are, indeed, necessary to support lasting change:⁷⁷

Doctrinal rituals occur on a very regular basis and have a routine, a regularity to them; they are meant to transmit information about the group (or community) beliefs, the values that are held dear, and to keep reaffirming them. They can also help introduce new information, which can be easier to integrate by being presented in a ritualized manner as it can bypass the conditioned behaviors. They

Mindfulness and Social Hostility," *Current Opinion in Behavioral Sciences* 3 (June 2015): 18–24; James K. Rilling and Alan G. Sanfey, "The Neuroscience of Social Decision-Making," *Annual Review of Psychology* 62, no. 1 (2011): 23–48; Brian J. Lucas and Robert W. Livingston, "Feeling Socially Connected Increases Utilitarian Choices in Moral Dilemmas," *Journal of Experimental Social Psychology* 53 (July 2014): 1–4; Raluca D. Szekeley and Andrei C. Miu, "Incidental Emotions in Moral Dilemmas: The Influence of Emotion Regulation," *Cognition & Emotion* 29, no. 1 (January 2015): 64–75.

⁷³ James K Rilling et al., "The Neural Correlates of Theory of Mind Within Interpersonal Interactions," *NeuroImage* 22, no. 4 (August 2004): 1694–1703; Alessandro Grecucci et al., "Reappraising the Ultimatum: An fMRI Study of Emotion Regulation and Decision Making," *Cerebral Cortex* 23, no. 2 (February 1, 2013): 399–410.

⁷⁴ Alan Kirman and Miriam Teschl, "Selfish or Selfless? The Role of Empathy in Economics," *Philosophical Transactions of the Royal Society B: Biological Sciences* 365, no. 1538 (January 27, 2010): 303–17.

⁷⁵ Pouligny, "Resilience, Trauma and Violence, Flagship Study on Societal Dynamics and Fragility."

⁷⁶ Seppala et al., "Loving-Kindness Meditation"; Hooria Jazaieri et al., "A Randomized Controlled Trial of Compassion Cultivation Training: Effects on Mindfulness, Affect, and Emotion Regulation," *Motivation and Emotion* 38, no. 1 (February 2014): 23–35; Hooria Jazaieri et al., "A Wandering Mind Is a Less Caring Mind: Daily Experience Sampling During Compassion Meditation Training," *The Journal of Positive Psychology* 11, no. 1 (January 2, 2016): 37–50; Hooria Jazaieri et al., "Enhancing Compassion: A Randomized Controlled Trial of a Compassion Cultivation Training Program," *Journal of Happiness Studies* 14, no. 4 (August 1, 2013): 1113–26; Cendri A. Hutcherson, Emma M. Seppala, and James J. Gross, "Loving-Kindness Meditation Increases Social Connectedness," *Emotion* 8, no. 5 (2008): 720–24.

⁷⁷ Quentin D Atkinson and Harvey Whitehouse, "The Cultural Morphospace of Ritual Form," *Evolution and Human Behavior* 32, no. 1 (January 2011): 50–62.

can also help give meaning to the ongoing transformations.

Imagistic rituals are much more infrequent and may involve larger gatherings; they involve more dramatic (even climactic), transformative events. They involve more emotion, bringing forth powerful memories and images. Their effects, however, can be short term; and this is where doctrinal rituals come as a necessary supportive complement.

Of course, the role of the ritual in **creating a safe space in which change becomes possible** is also absolutely crucial here.

4.2. Rituals serve as an important mechanism to convey intentions and create a space for the possibility of mutual understanding

Conveying intention is a central role of a ritual, which is essential in a process of creating change. Among the questions asked are: How can rituals be used to convey peaceful, benevolent or non-threatening intentions? How can non-violent intentions be communicated in a ritualized manner? How can rituals keep supporting an ongoing intention to sustain hope, wellbeing, and compassionate activity?

The sequence of rule-governed behaviors, characteristic of rituals, also helps create a space of mutual understanding among the participants.⁷⁸ Studies have shown, for instance, that predictable language patterns create neural coupling between speaker and listener.⁷⁹ This language can be verbal but also correspond to ritualized gestures serving as a “common language” that can, under controlled circumstances, facilitate understanding across groups and even cultures. Are there some fundamentals with regard to ritualized gestures?⁸⁰ Are there cross-cultural commonalities such as how to share food, how to demonstrate hospitality, etc.? How, in peacebuilding contexts, a common language can be found (and not presumed) is crucial.

Being able to build that mutual understanding around a certain number of rules is also crucial to achieving a certain level of trust that can lead to choosing cooperation instead of

⁷⁸ For an illustration of how ritual participation enhances the social bonds that connect its participants, see Sosis and Ruffle, “Religious Ritual and Cooperation: Testing for a Relationship on Israeli Religious and Secular Kibbutzim.”

⁷⁹ S Dikker et al., “On the Same Wavelength: Predictable Language Enhances Speaker-Listener Brain-to-Brain Synchrony In Posterior Superior Temporal Gyrus,” *The Journal of Neuroscience* 34, no. 6267–6272 (2014).

⁸⁰ Benjamin A Tabak et al., “Conciliatory Gestures Facilitate Forgiveness and Feelings of Friendship by Making Transgressors Appear More Agreeable,” *Journal Of Personality* 80, no. 2 (April 2012): 503–36; Michael E. McCullough et al., “Conciliatory Gestures Promote Forgiveness and Reduce Anger in Humans,” *Proceedings of the National Academy of Sciences of the United States of America* 111, no. 30 (July 29, 2014): 11211–16; Susan Goldin-Meadow, “Talking and Thinking with Our Hands,” *Current Directions in Psychological Science* 15, no. 1 (2006): 34–39.

confrontation. Humans tend to be a non-conflict species.⁸¹ By cooperating with others, we expend less energy to meet our needs than if we were constantly fighting with others. We therefore tend toward cooperation.⁸² However, the circle of others that we are naturally inclined to cooperate with is limited.⁸³ This circle is limited by **trust**: if we cooperate with others, we must trust that they will hold up their end of the social arrangement we agreed upon, and that they will share equitably any benefits from our cooperative efforts. Rituals can help support that trust.

4.3. Ritual can serve as a mechanism for diffusing conflict and building peace

From an evolutionary standpoint, rituals have often been used to regulate violence and aggressive encounters within nature. In traditional human societies, rituals have also been used quite extensively as a mechanism for diffusing and regulating conflict situations and situations of competitiveness, as well as to facilitate reconciliation and bring some kind of peace and truth. Douglas Fry's research on anthropological "peace systems" (clusters of neighboring societies that do not make war with one another) shows, through analyzing a variety of small-scale societies, that virtually every such society has complex and sophisticated rules for avoiding and resolving conflict. Specific rituals are used for regulating conflicts.⁸⁴

Hypothesis #5

Certain values associated with spirituality can play a vital role in motivating individuals and groups to choose peaceful behaviors, move beyond human divisions, and bypass usual in-group/out-group dynamics

5.1. Benevolence, compassion, and forgiveness are powerful values that can motivate a person to choose peace

There are certain spiritual or transcendent values, commonly held by all human beings, across traditions, religions and cultures that can motivate a person to choose peace and directly influence their behavior.

⁸¹ As quoted from Rossano, NSP Working Group Meeting, November 27 2016

⁸² Fehr and Fischbacher, "Social Norms and Human Cooperation"; Van Lange and Van Doesum, "Social Mindfulness and Social Hostility"; Rilling et al., "A Neural Basis for Social Cooperation"; Michael Tomasello and Amrisha Vaish, "Origins of Human Cooperation and Morality," *Annual Review of Psychology* 64, no. 1 (2013): 231–55.

⁸³ Fett et al., "Default Distrust?"

⁸⁴ See in particular DP Fry, "Environment of Evolutionary Adaptedness, Rough and Tumble Play, and the Selection of Restraint in Human Aggression," in *Ancestral Landscapes in Human Evolution*, ed. D Narvaez (Oxford Press, 2014), 169–88.

Schwartz has found that **benevolence** (as an inherent desire to do good, and to hold good intentions toward all living beings, including oneself) is a value that has been found present and most endorsed across cultures.⁸⁵ In the majority of the literature, however, benevolence as a value has been researched so far through the lens of **compassion** (and, in a more limited way, through loving-kindness), which has been the object of an increasing number of neuroscience studies, mostly focusing on the impact of compassion meditation on emotional and cognitive processes.⁸⁶

Compassion can be understood as a natural sense of concern that arises in us when confronted with another's suffering and feeling motivated to see that suffering relieved.⁸⁷ This definition implies the presence of three elements: a sense of understanding (cognitive empathy); a feeling for / emotional connection with the situation (emotional empathy); and a motivation and driven wish to do something about it.⁸⁸ Without empathy, it is impossible to have compassion. Different neuroscientific experiences have started to document the neural processes involved in empathy, as an emotional trait,⁸⁹ and more importantly on compassion as a more complex mental process that also includes an active component.

One important dimension of the process -- which echoes what has also been studied in some rituals -- is the perspective taking, which requires "both sharing and understanding the emotional state of others in relation to oneself."⁹⁰ The ability to identify with others is, both with rituals and values, the key to transformation. It is particularly key in reversing the effects of dehumanization / demonization of others.

⁸⁵ Shalom Schwartz, "An Overview of the Schwartz Theory of Basic Values," *Online Readings in Psychology and Culture* 2, no. 1 (December 1, 2012); Shalom H. Schwartz, "Universalism Values and the Inclusiveness of Our Moral Universe," *Journal of Cross-Cultural Psychology* 38, no. 6 (November 1, 2007): 711–28; Anat Bardi and Shalom H. Schwartz, "Values and Behavior: Strength and Structure of Relations," *Personality and Social Psychology Bulletin* 29, no. 10 (October 1, 2003): 1207–20.

⁸⁶ Antoine Lutz et al., "Regulation of the Neural Circuitry of Emotion by Compassion Meditation: Effects of Meditative Expertise," *PloS One* 3, no. 3 (March 26, 2008); Kathi J. Kemper and Hossam A. Shaltout, "Non-Verbal Communication of Compassion: Measuring Psychophysiological Effects," *BMC Complementary and Alternative Medicine* 11, no. 1 (December 1, 2011): 132; David J. Kearney et al., "Effects of Participation in a Mindfulness Program for Veterans with Posttraumatic Stress Disorder: A Randomized Controlled Pilot Study," *Journal of Clinical Psychology* 69, no. 1 (January 2013): 14–27.

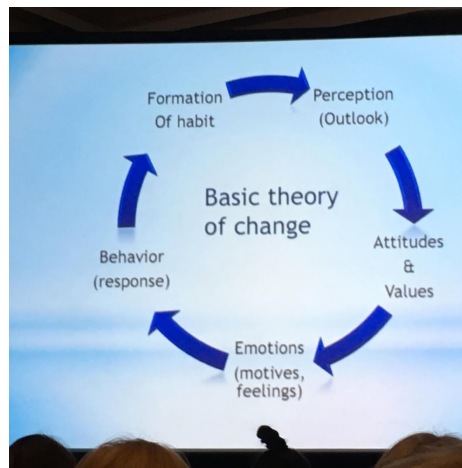
⁸⁷ Definition suggested by Geshe Thupten Jinpa, International Symposium for Contemplative Studies, San Diego, November 2016.

⁸⁸ This distinction between cognitive and emotional empathy is consistent with the definition by Daniel Goleman. See also Singer and Lamm, "The Social Neuroscience of Empathy."

⁸⁹ Yan Fan et al., "Is There a Core Neural Network in Empathy? An fMRI Based Quantitative Meta-Analysis," *Neuroscience & Biobehavioral Reviews* 35, no. 3 (January 2011): 903–11; Xiaosi Gu et al., "Anterior Insular Cortex and Emotional Awareness," *Journal of Comparative Neurology* 521, no. 15 (October 2013): 3371–88.

⁹⁰ Jean Decety, Kalina J. Michalska, and Yuko Akitsuki, "Who Caused the Pain? An fMRI Investigation of Empathy and Intentionality in Children," *Neuropsychologia* 46, no. 11 (September 2008): 2607–14.

The basic theory of change, as highlighted by Geshe Thupten Jinpa, looks as follows.⁹¹



Forgiveness is a value present in many faith traditions.⁹² Some communities may choose it as a focus for transformation, as it is the case with the project of the *Fundacion para la Reconciliacion* in Colombia. Father Leonel Gomez defines forgiveness as a choice to give up the urge for retaliation and instead act upon compassion and kindness. Forgiveness has been highlighted as a transformative process in a number of peacebuilding contexts.⁹³ There is also a growing literature studying the neuroscience of forgiveness.⁹⁴ In that context, forgiveness has been mostly conceptualized in terms of an adjustment in emotional memory. But other dimensions could be uncovered, including in terms of cost/benefit analysis in the individual and collective decision process (for instance, the benefit in terms of well-being: moving forward more efficiently and quickly than constantly reliving the event has a value in itself).

⁹¹ Source: Geshe Thupten Jinpa, International Symposium for Contemplative Studies, San Diego, November 2016. See also Jazaieri et al., "Enhancing Compassion."

⁹² Richard L. Gorsuch and Judy Y. Hao, "Forgiveness: An Exploratory Factor Analysis and Its Relationships to Religious Variables," *Review of Religious Research* 34, no. 4 (1993): 333–47.

⁹³ Scott L. Moeschberger et al., "Forgiveness in Northern Ireland: Model for Peace in the Midst of the 'Troubles,'" *Peace and Conflict: Journal of Peace Psychology* 11, no. 2 (June 1, 2005): 199–214; Judy Eaton, "From Local to Global: Perspectives on Peace, Forgiveness, and Reconciliation in Individuals and Groups," *Peace and Conflict: Journal of Peace Psychology* 17, no. 2 (April 19, 2011): 204–9; Ani Kalayjian and Raymond F. Paloutzian, eds., *Forgiveness and Reconciliation: Psychological Pathways to Conflict Transformation and Peace Building*, Peace Psychology Book Series (New York: Springer-Verlag, 2009).

⁹⁴ Emiliano Ricciardi et al., "How the Brain Heals Emotional Wounds: The Functional Neuroanatomy of Forgiveness," *Frontiers in Human Neuroscience* 7 (2013); Sabrina Strang et al., "Neural Correlates of Receiving an Apology and Active Forgiveness: An fMRI Study," *PLOS ONE* 9, no. 2 (February 5, 2014).

5.2. Some conditions are needed for the values to actually translate into choices that go beyond usual human divisions, including in the most stressful circumstances

These values rely on a sense of transcendence in the relationship with others. When actively nurtured, they can become positive qualities cultivated by individuals and groups, including in the most adverse circumstances. This supposes a number of conditions that are crucial in a peacebuilding environment.⁹⁵ Identifying these conditions will require additional experiments and research to complement the limited knowledge we can currently rely on:

Competition in the decision-making process:

- Understanding how those values “perform” when emotion and “higher cognition” enter in competition in a decision-making process;⁹⁶
- Understanding how individuals make choices or resolve conflicts between self-interest and “other-regarding motives,” a process that engages “reward-related brain areas, such as the striatum, and with prefrontal activity implicated in cognitive control, the processing of emotions, and integration of benefits and costs.”⁹⁷
- Understanding what happens when these values compete with other values deeply held by a community or a group, in particular sacred values; how do individuals and communities reconcile these different values?⁹⁸

On all those points, the hypothesis is that the practice of spiritual values and development of the qualities and skills attached to them can successfully pass these different tests.

Connecting values, moral qualities and behaviors:

- Connecting the qualities with behaviors is another crucial test, which means articulating social emotional intelligence and social change;
- Documenting the capacity to maintain the values under extreme stress and when trauma is triggered (distinction between inactive cognition and interactive cognition). We can learn from sport psychology about how values play a role in increasing human performance under adversity.⁹⁹ We hypothesize that spiritual

⁹⁵ See Nancy Eisenberg, “Emotion, Regulation, and Moral Development,” *Annual Review of Psychology* 51, no. 1 (2000): 665–97.

⁹⁶ Joshua D. Greene et al., “The Neural Bases of Cognitive Conflict and Control in Moral Judgment,” *Neuron* 44, no. 2 (October 14, 2004): 389–400.

⁹⁷ Ernst Fehr and Colin F. Camerer, “Social Neuroeconomics: The Neural Circuitry of Social Preferences,” *Trends in Cognitive Sciences* 11, no. 10 (October 2007): 419–27; Chad E. Forbes and Jordan Grafman, “The Role of the Human Prefrontal Cortex in Social Cognition and Moral Judgment,” *Annual Review of Neuroscience* 33, no. 1 (2010): 299–324.

⁹⁸ For an example, see Deborah F. Shmueli, Noga Collins-Kreiner, and Michal Ben Gal, “Conflict Over Sacred Space: The Case of Nazareth,” *Cities* 41, Part A (December 2014): 132–40.

⁹⁹ Frank Gardner and Zella E. Moore, *The Psychology of Enhancing Human Performance: The*

values motivate and support peacebuilders (understood as individuals who actively make the choice of peace) and allow them to perform better, as peacebuilders, including under adversity through three main mechanisms:

- The clarity of **motivation**, the “why” of their commitment, the “why” of their wanting change (the reward). The point is not to find all the different motivators, but rather one compelling motivation that can serve as one’s personal anchor for action.¹⁰⁰ This could start by asking the following questions:
 - What is the single most important value that motivates you in your life?
 - What is driving you in your work as a peacebuilder?
 - What is the single value that is the most important for your work as a peacebuilder?
- The clarity of **meaning**: what has heart and meaning for the individual concerned. The mediation of meaning-making is crucial and is generally very highly individualized: how each individual interprets each value they put forward. These values have to do with one’s core identity, and will likely drive that person when she is under extreme stress.
- **Practice and Integrity** in relation to one’s value. There is an element of commitment that is also part of this process. Understanding how peacebuilders develop this can also help us to understand better how the core spiritual values they choose to focus on can serve as a sustainable anchor for their choices and actions, and resist the most challenging circumstances.

Hypothesis #6

Certain types of deliberate intentional practices and rituals are essential in supporting the alignment of individual behaviors and values

6.1. Moments of shock /revelation / transcendence, as well as imagistic rituals, are crucial in the alignment of behaviors with values

Values do not necessarily correlate with behavior or firmly held beliefs.¹⁰¹ For instance, a person may value benevolence and charity as a cultural ideal, but exhibit violent or exclusionary behavior and hold firm beliefs about the rightness of the in-group and otherness of the out-group. This can become entrenched in what is commonly known as “sacred values,” or non-negotiable values that can encourage violent or exclusionary

Mindfulness-Acceptance-Commitment Approach, 1 edition (New York: Springer Publishing Company, 2007).

¹⁰⁰ Amy Wrzesniewski et al., “Multiple Types of Motives Don’t Multiply the Motivation of West Point Cadets,” *Proceedings of the National Academy of Sciences of the United States of America* 111, no. 30 (2014): 10990–95.

¹⁰¹ Schwartz, “An Overview of the Schwartz Theory of Basic Values.”

behavior.¹⁰²

However, in certain pivotal moments, individuals can realize that their behaviors are not in alignment with their culturally-determined values. To draw on the previous example, the person who values benevolence but exhibits exclusionary behavior may suddenly recognize this disconnection when exposed to a dramatic moment of suffering by an out-group individual. In that powerful moment, the individual may recognize that they are not living according to their values and make the *conscious choice* to change their behavior. These moments can often be considered as instances of intense shock, transcendence, or revelation. As noted by Wood and Mazur in their research into mindful engagement, nearly all the peacebuilders they interviewed could point to a specific, life-changing moment when their values were challenged and they realized that they wanted to dedicate their lives to social justice.¹⁰³

These pivotal moments are often crucial in the alignment of behaviors with values in large part because they are infused with intense emotion. The emotional charge of the experience makes the experience particularly memorable, which can help an individual recall their connection with their values in moments of intense stress (see 6.2.). Numerous studies have demonstrated that emotion plays a significant role in the formation of memory;¹⁰⁴ in one recent study, it was demonstrated that strong emotional states have a prospective quality that can literally “carry over” and enhance memory formation in the future.¹⁰⁵ The intensity of the emotion in these pivotal moments create indelible memories that can help the individual choose to align their behavior with the values under moments of intense stress (such as choosing peace in times of conflict); however, as we will see in the next section, these memories need to be refreshed and restored through some form of deliberate practice.

6.2. Some form of deliberate practice, devotion, or ritual is necessary to reaffirm these powerful and emotionally-charged memories and maintain the connection between outward behavior and core spiritual values

These pivotal experiences are frequently mentally rehearsed and “reconsolidated,” and maintained through some form of intentional practice, devotion, or ritual. Recent studies

¹⁰² Shmueli, Collins-Kreiner, and Gal, “Conflict over Sacred Space”; Hammad Sheikh, “Religious Ritual and Sacred Values” (Doctoral Dissertation, The New School, 2014).

¹⁰³ Wendy Wood and Thais Mazur, *Do No Harm: Mindful Engagement for a World in Crisis*, 2 edition (RioKai Press, 2016), <http://mindfulengagement.org/>.

¹⁰⁴ Brandon J. Schmeichel, Rachael N. Volokhov, and Heath A. Demaree, “Working Memory Capacity and the Self-Regulation of Emotional Expression and Experience,” *Journal of Personality and Social Psychology* 95, no. 6 (2008): 1526–40.

¹⁰⁵ Arielle Tambini et al., “Emotional Brain States Carry Over and Enhance Future Memory Formation,” *Nature Neuroscience*, December 26, 2016.

have shown that when memories are retrieved they enter into a period of consolidation during which time they are rendered labile, or liable to change; during reconsolidation, new information can be added that will affect the formation of the memory, especially if this updated information is repeatedly introduced across multiple consolidation windows.¹⁰⁶

The hypothesis here suggests that through revisiting these pivotal experiences again and again, either through mentally remembering or rehearsing through some form of ritualized activities, individuals can continually refresh and reaffirm their connection with their values.

In this way, rituals (both small, personal doctrinal rituals or large, collective imagistic rituals) can help reinforce the practical role of values, **through repeated, intentional practice, also called deliberate practice**. Deliberate practice is considered essential to the acquisition of expertise and its extent is directly related to the ultimate level of skill attained.¹⁰⁷ Deliberate practice is a unique form of activity, distinguishable from both work and play, where goal-directed, concentrated effort is expended to improve specific mental and physical skills. Therefore, “if one is to achieve moral expertise, then one must engage in deliberate moral practice.”¹⁰⁸

Matt Rossano has offered some cues into analyzing the process of such practice:

The elements of deliberate moral practice appear to be present in the rituals and activities of most major religions. Are some of these elements more critical than others? As mentioned previously, it seems that religion’s behavioral proscriptions, rituals of moral review, and meditative practices are especially relevant to developing self-control, empathy, and wisdom, which in turn promote moral behavior. Can these elements be divorced from specifically religious beliefs and still retain their effectiveness? Given that supernatural beliefs are a prime motivator of moral practice, the current model would predict that secularizing moral practice would strip it of its

¹⁰⁶ Gregory J. Quirk et al., “Erasing Fear Memories with Extinction Training,” *The Journal of Neuroscience* 30, no. 45 (November 10, 2010): 14993–97; Daniela Schiller et al., “Preventing the Return of Fear in Humans Using Reconsolidation Update Mechanisms,” *Nature; London* 463, no. 7277 (January 7, 2010): 49–53.

¹⁰⁷ KA Ericsson and AC Lehmann, “Expert and Exceptional Performance: Evidence on Maximal Adaptations on Task Constraints,” *Annual Review of Psychology* 47 (1996): 273–305; KA Ericsson, “Attaining Excellence through Deliberate Practice: Insights from the Study of Expert Performance,” in *The Pursuit of Excellence Through Education*, ed. Ferrari (Mahwah, NJ: Erlbaum, 2002), 21–56.

¹⁰⁸ Matt J. Rossano, “The Moral Faculty: Does Religion Promote ‘Moral Expertise?’,” *International Journal for the Psychology of Religion* 18, no. 3 (July 10, 2008): 169–94; Doug Oman and Carl E. Thoresen, “Spiritual Modeling: A Key to Spiritual and Religious Growth?,” *International Journal for the Psychology of Religion* 13, no. 3 (July 1, 2013): 149–65.

motivational force, thus leaving far fewer willing to expend the required effort to perfect moral skills (unless another equally powerful motivator can be found).¹⁰⁹

One of the ways to support values that enshrine cooperation instead of conflict and to elevate them to become the ones you or your group follows (even when conflict may be a more natural option) is to be consistently reminded of them. Religion and spirituality can offer this through **ritualistic practices**, done on a regular basis (meditation, prayer, ceremonies, etc.). As these practices become part of the daily life, the individuals are being reminded of the values behind these regular practices. Thus, there is a higher chance of these values influencing individuals' behavior, even in the more stressful circumstances. Because of the practices some people are engaged in, they are better at being virtuous; they develop a **moral expertise**. They have less of a tendency to let naturally evolved values that could lead to conflict (such as revenge) take over.

It is helpful to think of morality not only in terms of moral dilemmas and reasoning, but as **a skill**, similar to the way basketball or tennis is a skill. We have to practice these skills to remind our bodies what the right moves are. Similarly, ritualistic practices, which engage self-control and self-monitoring and emphasize empathy over ego-centrism turn us outwards toward others, not inwards. They do not have to be religious practices, but they are practices that contribute to making us more skillful morally: the same way one needs to throw free-throws repeatedly, one must engage in those kinds of practice to help one's brain and nervous systems to remember what the right moves are to go through life. A chronic access to values facilitates their cognitive activation, supporting value behavior concordance, including for youth.¹¹⁰

The Program for Reconciliation in Colombia (ESPERE) provides a good illustration of that process: intentional deliberate practices as well as rituals are used to create new habits, progressively seeing people changing their narratives in the sense of choosing compassion and kindness (forgiveness) instead of revenge, progressively aligning their choices and behaviors with the value that they have decided to embody.

There are going to be people in a group at different levels of that skill (just like on a basketball team). Other members of the team may not always make the right moves, despite their practice. They should be able to follow what the coach says. This is where we need **authority figures and role models**, as well as other players to remind them what to

¹⁰⁹ Rossano, "Ritual Behaviour and the Origins of Modern Cognition," 246–47.

¹¹⁰ Michael T. Warren, "Becoming Who They Want to Be: Cross-National and In-Depth Examinations of Value-Behavior Concordance, Mindfulness, and Thriving in Adolescence" (Ph.D., The Claremont Graduate University, 2016).

do when the time comes. One may become overwhelmed with emotions in a particular situation, but one needs to know enough to look at one of these role models. This can also be said about morality and how we react. There may be places where the skill level is not up to the level to avoid conflict. But, hopefully there are authority figures that can be trained to be more adept at modeling those skills and inspiring others, and then train the rest to avoid conflict when faced with adversity.

We know that daily rituals and practices have a practical impact for the individual. **How this translates into larger tribes or groups** is a bigger question. This is where the role of authority figures and role models can be crucial.

Hypothesis #7

The experience of transcendence through spirituality gives individuals access to a wider sense of interconnectedness that goes beyond "self-other" dichotomies and which therefore may support overcoming psychologies that support violence and othering

7.1. The transcendence of the ego is intrinsically linked to an experience of wider interconnectedness, opening the participants to a spiritual ritual to the possibility of bypassing usual in-group / out-group dynamics

Spiritual rituals introduce a dimension of transcendence of the ego, which is intrinsically linked to an experience of interconnectedness (the sense of being connected with everyone and everything around). Here, spirituality is approached as an experience, beyond any belief system. A scale has been developed in Germany to measure meditation depth that incorporates components such as transcendence of ego in order to measure how "deep" one goes meditatively.¹¹¹

This element of transcendence can also be found to some of the spiritual values that we referred to: inherent to the notion of compassion, for instance, is that sense of connectedness beyond human divisions. The hypothesis here is that this element of transcendence can allow individuals to bypass usual in-group/out-group dynamics (and potential polarization). If effectively tapped into, through the pairing of spiritual values and rituals, it can become a powerful resource for peacebuilding.

¹¹¹ Britta Hölzel and Ulrich Ott, "Relationship Between Meditation Depth, Absorption, Meditation Practice, and Mindfulness: A Latent Variable Approach," *Journal of Transpersonal Psychology* 38, no. 2 (December 2006): 179–99.

7.2. Transcendence is also associated with a sense of hope that supports individual and collective well-being

Hope is a second character strength associated with transcendence. The hope engendered by religious faith may be an important factor in the generally positive association between religion and well-being.¹¹² Here, the sense of hope is also connected to complex individual and collective belief systems that color the action that is taking place.

The most relevant area of literature might be the emerging study on the neuroscience of placebo effects, highlighting the importance of spiritual belief systems as part of the processes that can influence disease related symptoms, physiological signs and other behaviors.¹¹³ A recent review of existing research by Tor D. Wager and Lauren Y. Atlas provides a few avenues that could be interesting for us, although it shows there to be a deep complexity (there is not one effect but many, probably involving multiple mechanisms).¹¹⁴ The study provides a framework that includes three types of psychological antecedents that give rise to placebo effects—pre-cognitive associations, conceptual processes (for example, expectancies) and affective or motivational states — with different brain substrates. These antecedents give rise to placebo effects on three kinds of outcomes: disease related symptoms (for example pain), physiological signs and other behaviors. Spiritual belief systems are part of these conceptual processes, and it would therefore be interesting to assess how they might influence placebo mechanisms, and what are the exact mechanisms at stake.

A variation in that line of inquiry would be to understand the influence of having someone experiencing healing in a spiritual context (or belief system) different from theirs. Is spirituality playing a role regardless of which belief system it is associated with? In that case, what is the mechanism associated with that framing?

Another variation would be to study groups of people of different spiritual paths praying or meditating together. What happens there?

¹¹² A recent review of existing research is provided in Charles R. Snyder, David R. Sigmon, and David B. Feldman, "Hope for the Sacred and Vice Versa: Positive Goal-Directed Thinking and Religion," *Psychological Inquiry* 13, no. 3 (July 2002): 234–238.

¹¹³ Tor D. Wager and Lauren Y. Atlas, "The Neuroscience of Placebo Effects: Connecting Context, Learning and Health," *Nature Reviews Neuroscience* 16, no. 7 (June 19, 2015): 403–18; Jacobs, "The Physiology of Mind-Body Interactions"; Daniel E. Moerman and WB Jonas, "Deconstructing the Placebo Effect and Finding the Meaning Response," *Annals of Internal Medicine* 136, no. 6 (March 19, 2002); F. Benedetti et al., "Neurobiological Mechanisms of the Placebo Effect," *Journal of Neuroscience* 25, no. 45 (November 9, 2005): 10390–402.

¹¹⁴ Wager and Atlas, "The Neuroscience of Placebo Effects."

7.3. Surrender, as a third dimension of transcendence, is a powerful process in increased awareness and trust

The experience of transcendence is associated with an **emotional decentering and distancing** that comes from a **surrender to a higher order or something bigger than oneself**. Its by-products generally are an increase in self-awareness, calmness, clarity and trust.

Initial research has been published on the study of **the impact of prayer** on reducing alcohol craving (a stress response) and also the brain activity that is associated with the physiology of the flight or fight response.¹¹⁵ One hypothesis to explain that impact is that, during the process of prayer, the individual experiences a sense of surrender in the call for help. The act of going beyond oneself would somehow reduce the fight and flight response. This hypothesis is still fairly speculative at this stage of the neuroscience development; however, recent studies on members of Alcoholics Anonymous allude that surrendering to something greater than oneself is an essential aspect of empowerment and recovery.¹¹⁶

Transcendence, in its surrendering dimension, has also been highlighted as **helping mitigate the effects of trauma**. In a study on families of Cambodian refugees at the Thai Border in the mid-80s, Dr. Richard F. Mollica (Director of the Harvard Program in Refugee Trauma of Massachusetts General Hospital and Harvard Medical School) highlighted spirituality, along with work and altruism as one of the core elements that helped mitigate the trauma, helping bring the individuals outside of themselves, outside of the anger and the sorrow.¹¹⁷

Surrendering to a wider dimension also generally comes with an experience of **larger**

¹¹⁵ Marc Galanter et al., "An Initial fMRI Study on Neural Correlates of Prayer in Members of Alcoholics Anonymous," *The American Journal of Drug and Alcohol Abuse* 43, no. 1 (January 2017): 44–54. For a summary, see for instance:

<http://www.medicaldaily.com/alcoholics-anonymous-reduce-cravings-prayer-385092>

¹¹⁶ Dara G. Ghahremani, "Craving, Prayer, and the Brain," *The American Journal of Drug and Alcohol Abuse* 43, no. 1 (January 2, 2017): 1–3.

¹¹⁷ In 1988, Richard Mollica and the Harvard Program in Refugee Trauma (HPRT) were commissioned by WHO in 1988 to do a study of internees at Site 2, the largest IDP camp sited on the Thai-Cambodian border. It housed 190,000 refugees, was closed, and work was not allowed. The study lasted for a year and interviewed the heads of 1000 households. Results: 37% of the population sample had PTSD and 68% had depression when screened by validated instruments (HSCL-25 and HTQ). Malnutrition, kwashiorkor, and marasmus were endemic as was suicide with 20 deaths per month. Internees reported that work, altruism and spirituality decreased the prevalence of symptoms and maladaptive behaviors by 50%. The HPRT study was a landmark; it represented the first in-depth public health study of the epidemiology of the psychological wounds of wars. Mollica et al. "Science-based Policy For Psychosocial Interventions in Refugee Camps" in J. Nerv & Mental Dis. (2002) 190(3):158-66, *Harvard Guide to Khmer Mental Health*. ed. Lavelle Harvard University Press 1996 and "The Effect of Trauma and Confinement" JAMA (1993) 270:581-86. See also Richard F. Mollica, *Healing Invisible Wounds: Paths to Hope and Recovery in a Violent World*, 1 edition (Nashville: Vanderbilt University Press, 2008).

meaning making. The experience of transcendence through the spiritual ritual helps give sense to what has happened. When the experience is of collective nature, it can contribute to the adaptation of the larger systems of meaning, contributing to the reinforcement of cultural values that support resilience and a possible shift away from violence as an ongoing dynamic process.¹¹⁸ Imagining the future (prospection) and conceiving the vision of others (theory of mind) are all used to imagine perspectives and events beyond the immediate environment. This meaning making process is particularly important to address the moral dimensions of trauma healing.

¹¹⁸ Pouligny, "Resilience, Trauma and Violence, Flagship Study on Societal Dynamics and Fragility."

V. SELECTED BIBLIOGRAPHY

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