

NEUROSCIENCE *and* PEACEBUILDING

Exploring the Neurobiological Dimensions of Violent Conflict
and the Peacebuilding Potential of Neuroscientific Discoveries

PART II: GROUP DYNAMICS

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About *NeuroPeace*

NeuroPeace is an online, open-source series focusing on research and practice at the nexus of neuroscience and peacebuilding. *NeuroPeace* includes articles and essays by scholars and practitioners exploring how neuroscientific insights can inform peacebuilding processes, including supporting dialogue, fostering reconciliation, and preventing violence, as well as addressing the fundamental causes of harmful conflict and barriers to lasting peace.

This part of *NeuroPeace* is the second of three-parts of an edited volume that brings together a group of researchers in neuroscience to share—in an accessible and engaging way—their work and how it might be relevant to those working to prevent wars, terrorism, and violent conflict, and to help societies and individuals heal in the aftermath of violence. The series covers a range of topics grouped under three broad themes: Individual Aggression (*NeuroPeace* No. 1), Group Dynamics (*NeuroPeace* No. 2), and Trauma (*NeuroPeace* No. 3).

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Reducing Intergroup Conflict and Promoting Commonality and Cooperation

Aharon Levy, John F. Dovidio, and Tamar Saguy

Intergroup relations are commonly characterized by threat, bias, and distrust that can fuel violent conflict, particularly in contexts involving scarce resources. The present article considers the psychological bases of intergroup bias and conflict and explains how greater understanding of these processes can inform interventions to reduce bias, facilitate peacebuilding, and promote reconciliation. Moreover, recent developments in the field of neuroscience now enable the examination of theories in the realm of social and cognitive psychology using cutting-edge neuroscience methodologies. Social neuroscience explores the cognitive and physiological mechanisms involved in social psychological processes. For example, functional neuroimaging (fMRI) utilizes localized brain activity in order to associate brain processes with cognitive, affective, and social influences that underlie intergroup orientations and behavior. Another influential technique for measuring brain activity is electroencephalography. When neurons in the brain are active, they emit small electric impulses that electroencephalographic techniques detect through electrodes placed on a participant's scalp. Whereas fMRI is particularly effective for identifying locations in the brain that are active in response to a specific stimulus, electroencephalography can detect rapid changes in brain activity that represent how stimuli are processed. Thus, introducing neuroscience into the study of social behavior can help illuminate how the human brain functions in social relations as well as validate and extend existing psychological theory¹ and inform peacebuilding interventions. The present article presents an overview of relevant neuropsychological findings that offer insights into the psychology of intergroup conflict and reconciliation.

The Foundations of Intergroup Conflict

Basic social-cognitive processes, which relate to how others are perceived and evaluated, shape the ways people think and feel about individuals and groups. In this section, we consider these processes, particularly those pertaining to social categorization and identification. We also consider how structural relations between groups—for example, situations involving competition over scarce resources—can contribute to intergroup conflict. The psychological, neuroscience, and behavioral science evidence presented in this section provides insights into both challenges and prospects for peacebuilding.

Social Cognition, Categorization, and Identity

According to evolutionary psychologists, the capacity to understand one's environment through intellect represents one of the most critical developments benefiting human survival as a species. This human adaptation involves psychological processes relating to what people attend to, how they learn and acquire knowledge, and how they systematically rely on shortcuts (heuristics) in information processing to deal with the complexities of social, as well as physical, environments.

To cope with the enormous complexity of the world, people develop heuristics and other simplifying principles for thinking about important elements in their environment. Categorization is one of the most basic processes in the way that people actively derive meaning from complex environments. Categorization enables decisions about incoming information to be made quickly, because the instant an object is categorized it is assigned the properties shared by other category members. Thus, social categorization—thinking about others in terms of their group membership—eliminates time-consuming, inefficient consideration of the meaning of every experience. Event-related potential (ERP) findings (that measure brain response that is the direct result of a specific sensory, cognitive, or motor stimuli) show that social categorization often occurs extremely rapidly, reflected in brain processing that occurs within milliseconds, and automatically on the basis of physical characteristics, similarity, or shared identity.² However, engaging in social categorization compromises accuracy for efficiency.³

Thinking about others in terms of their group membership (social categorization) rather than their individual qualities has a profound social impact. It influences the ways people perceive, think about, and evaluate others.⁴ When people or objects are categorized into the same category, they are regarded as more similar than they actually are, and

more similar than they were before they were categorized together. In addition, distinctions between members of different categories become exaggerated. Thus, categorization enhances perceptions of similarities within and differences between groups.

People also spontaneously classify ingroup and outgroup members into “us” vs. “them.”⁵ They do so because human beings are not only uniquely intelligent, but also, by nature, social animals. Group living has been, throughout human history, essential to survival. Human activity is rooted in interdependence. Group systems involving greater cooperation have substantial survival advantages for individual group members over those systems without reciprocally positive social relations.⁶ Thus, groups are bounded communities of mutual trust and obligation that delimit mutual interdependence and cooperation.

Neuroscience research further reveals that brain activation occurs in fundamentally different ways based on how others are perceived and socially categorized.⁷ Seeing another person as similar, such as when the person is categorized as an ingroup member, activates a specific part of the brain (the middle medial prefrontal cortex, PFC)⁸. In general, the network of brain activation that occurs when people think about the ingroup (compared to the outgroup)—which involves the cortical midline structures, tempoparietal junction, and the anterior temporal gyrus—correspond to the network activated when thinking about the “personal self.”⁹ These activation effects occur spontaneously, even when people are arbitrarily assigned to different groups (e.g., the red group vs. the blue group) that have no naturalistic meaning. Also, the more strongly people identify with the group, the more strongly they activate brain networks associated with the self when they think about the ingroup.¹⁰ By contrast, viewing another person as dissimilar, such as when the person is categorized as an outgroup member, activates a different part of the brain, the dorsal medial PFC, which is an area that is also activated by nonsocial objects.¹¹

Upon classification of people as members of the ingroup or an outgroup, people view ingroup members more positively.¹² The neural basis of this response is implicated by research on oxytocin, a hormone that acts as a neuromodulator in the brain that facilitates motivations for social connection. Administration of oxytocin enhances positive associations and cooperation with ingroup members, toward whom individuals are positively predisposed.¹³ Oxytocin, however, does not have these effects on responses to outgroup members. In addition, people display greater empathy toward ingroup than outgroup members in behavior and brain processes. When people witness another person in pain, they exhibit greater activation of the anterior cingulate cortex (ACC), supplementary motor area (SMA), and anterior insula (AI)—the shared neural circuit for pain—when the

other person is an ingroup member compared with an outgroup member. These findings have been obtained across a range of types of social categorization. For example, fMRI studies found that participants presented with videos of a person in physical pain showed more activation in the ACC when the person in pain was a racial ingroup member (a white person) compared with a racial outgroup member (an Asian person).¹⁴ Responses of soccer fans to pain expressions by members of their favorite team or a rival team showed similar results.¹⁵ Moreover, ERP research has also revealed that Christian and atheist participants showed stronger frontal neural activity to pain expressions by those with the same religious beliefs compared to those with different religious beliefs despite sharing the same race with all targets.¹⁶

In contrast to their automatic affiliative responses toward ingroup members, when presented with outgroup members, people, particularly those more prejudiced toward the outgroup, experience threat.¹⁷ Threat is measured not only behaviorally but also in terms of brain activation (using both ERP and fMRI techniques)¹⁸ and autonomic responses (e.g., cardiac and hormonal responses).¹⁹ In part, due to an expectation that outgroup members would behave negatively toward their group, people often show a preference for ingroup members who show bias against outgroup members. In fact, expressing biases toward members of another group enhances the social connection among members of the ingroup.²⁰ Also, viewed through the lens of threat, people are generally suspicious of outgroup members and, as a consequence, often interpret seemingly positive overtures from the outgroup as manipulative and deceitful.²¹ Moreover, facilitating extreme forms of conflict and violence, people perceive outgroup members as less human compared with ingroup members and value their lives less.²² Indeed, for extreme outgroups that elicit feelings of disgust, people display reduced activation of the medial prefrontal cortex (mPFC), presumably because they are seen as less human.²³

Whereas social categorization that distinguishes the ingroup from outgroups automatically produces a propensity toward intergroup bias and conflict, social identity theory²⁴ and self-categorization theory²⁵ highlight how the degree of identification with one's group can further motivate responses leading to intergroup conflict. According to social identity theory, the need to feel good about oneself is a basic human drive. One way to achieve this end is to join groups that are socially valued; another is to increase the perceived worth of the social groups to which one already belongs. Experiencing a sense of the positive distinctiveness of one's group may be achieved by contributing directly to the success of the group; however, this success may sometimes occur at the expense of others

by derogating, discriminating against, or harming another group. Within social identity theory, successful intergroup discrimination is thus presumed to restore, enhance, or elevate one's self-esteem. Self-categorization theory further emphasizes that in this process people come to think of themselves and other ingroup members mainly in terms of a group prototype, the standard of what a member of that group should be. This standard is typically one by which members of other groups are judged as inferior. When people experience a visceral feeling of "oneness" between the self and the group, they have attained the discrete experience of identity fusion. According to one study, which included participants from eleven countries spanning six continents, people who are fused with their group, compared with those who are not, indicated that they were more willing to fight and die on behalf of their group.²⁶

The principles of social identity theory and self-categorization theory have also been applied to theorizing about the perpetrators of historical atrocities. For example, actions such as those of the Nazis during the Holocaust may be ascribed not to blind obedience or extreme conformity, but to the sense of moral superiority, coupled with the sense of identification with a likeminded group that had a true hatred for Jews, homosexuals, and gypsies.²⁷ Individuals who identify more strongly with their group are more likely to engage in such actions, and people who experience identity fusion with their group are particularly prone to extreme action on behalf of their group and its members.

Overall, the scientific literature suggests that the foundation for intergroup bias and conflict may be laid with psychological and brain processes. In the next section, we consider another critical catalyst, the nature of the social environment, in the dynamics of relations between groups.

Social and Functional Relations between Groups

In sociology as well as psychology, theories based on functional relations often point to competition as a fundamental cause of intergroup prejudice and conflict. Realistic group conflict theory, for example, posits that perceived group competition for resources produces efforts to reduce the access of other groups to the resources. This process was illustrated in classic work by Muzafer Sherif and his colleagues.²⁸

In 1954, Sherif and his colleagues conducted a field study on intergroup conflict in an area adjacent to Robbers Cave State Park in eastern Oklahoma in the United States. In this study, twelve-year-old boys attending summer camp were randomly assigned to two

groups (who subsequently named themselves Eagles and Rattlers). Over a period of weeks, they first became aware of the other group's existence and then engaged in a series of competitive activities (e.g., athletic activities such as tug-of-war, baseball, and touch football). These competitive activities generated derogatory stereotypes and conflict among these groups. Fistfights broke out between members of the groups, and the boys began carrying sticks, baseball bats, and socks filled with rocks as potential weapons. Intergroup contact under neutral, noncompetitive conditions did not ameliorate the conflict—and sometimes it exacerbated it. Only after Sherif and his colleagues altered the functional relations between the groups by introducing a series of superordinate goals—ones that could not be achieved without the full cooperation of both groups and which were successfully achieved—did the relations between the two groups become more harmonious.

The nature of the intergroup interactions between the two groups of boys exemplifies the role of functional relations between groups in determining intergroup attitudes.²⁹ When groups are competitively interdependent, the interplay between the actions of each group results in positive outcomes for one group and negative outcomes for the other. This win-lose, zero-sum competitive relationship between groups is a major obstacle to peacebuilding. It can initiate mutually negative feelings and stereotypes toward the members of the other group and spiral into repeated, reciprocally escalating aggressive actions.

Competition between groups does not have to be over immediate, tangible resources to cause intergroup conflict. People who feel that their group's status in society or that their group's culture will be eroded by the actions of another group also react negatively. These negative reactions are grounded in physiological and neural responses. Physiologically, believing that intergroup competition threatens the status of one's group activates the sympathetic-adrenal-medullary adrenal axis in combination with the hypothalamic-pituitary-adrenal (HPA) axis, which produces cortisol, the main stress hormone. At the cardiovascular level, vascular resistance is high, cardiac output is low, and blood pressure is typically high.³⁰ In terms of brain activity, perceptions that another group is succeeding in competition for social position over one's group activates the ACC and insula, whereas perception of the advantage of one's group in competition with another group activates the ventral striatum, which is associated with the subjective experience of pleasure. Greater central striatum activation is also related to greater intentions to aggress against the other group, suggesting that intergroup violence under these circumstances is associated with some degree of pleasure.³¹

Functional relations also do not have to involve explicit competition between groups for resources or status to generate biases. Perhaps in part because there are evolutionary reasons why groups tend to compete,³² even in the absence of any direct evidence, people typically presume that members of other groups are competitive and will hinder the attainment of one's goals. In addition, individuals who more strongly prefer hierarchical rather than egalitarian relations between groups (a characteristic of people high in social dominance orientation, who see group relations competitively) chronically show less response when perceiving the pain of others in regions of the brain critical to the ability to share and feel concern for the misfortune of others (i.e., in the left anterior insula and anterior cingulate cortex). This pattern of brain activity occurs for these individuals regardless of the presence of explicit competition for resources or status with others.³³ Moreover, competition does not have to involve material resources to create intergroup conflict; it can involve symbolic issues, such as challenges to one's cultural, religious, or national values and standards by other groups.³⁴ In contrast, cooperatively interdependent relations between members of different groups can reduce bias and ameliorate conflict.

Psychological and neuroscience perspectives converge to illuminate the processes—social categorization, social identity, and functional interdependence—that underlie and shape relations between groups. When left unmanaged, these processes tend to create and sustain intergroup bias and social conflict in ways that represent major barriers to peacebuilding efforts. Nevertheless, these are general principles and mechanisms that, when appropriately directed and structured, can significantly improve intergroup relations. We next consider how understanding these processes can help guide strategies for reducing intergroup contact and improving relations between groups and their members.

Promoting Integration and Reconciliation

Although thinking about people in terms of their group membership may be the cognitive “default,” people are able to think about others in terms of their individual qualities when they are so motivated.³⁵ In addition, categorizing people in terms of their group memberships is a dynamic process. People possess many different group identities, and they are capable of thinking of themselves and others as members of different groups at different times, as well as focusing on multiple social categories simultaneously. By modifying a perceiver's goals, motives, perceptions of past experiences, expectations, as well as factors within the perceptual field and the situational context more broadly, there is

opportunity to alter the level of category inclusiveness that will be primary or most influential in a given situation. This malleability of the level at which impressions are formed is important because of its implications for altering the way people think about members of ingroups and outgroups, and consequently about the nature of intergroup relations. In the remainder of this section, we review two ways to do this. One way involves the attempt to promote individuating perceptions of others (decategorization/personalization), and the other incorporates efforts to create an inclusive category that encompasses both groups (recategorization).

Decategorization and Personalization

Based on the assumption that the categorization of people into different groups, specifically the ingroup and an outgroup, forms the foundation for bias, the goal of *decategorization*³⁶ is to weaken the salience of group boundaries. Specifically, decategorization interventions encourage people from different groups to regard one another primarily as distinct individuals and to interact in interpersonal (i.e., “me” and “you”) rather than group-based (i.e., “we” vs. “they”) modes of relating to one another. In addition, if decategorization occurs through personalized interactions in which information about each other’s unique qualities is exchanged, intergroup bias will be further reduced by undermining the validity of the outgroup stereotypes.³⁷ Decategorization reduces intergroup bias in part by improving attitudes toward others previously categorized as outgroup members but also by producing less favorable responses to those who were previously perceived as members of one’s ingroup.

In contrast to the individuation/decategorization approach, *personalization*³⁸ involves receiving self-relevant, more intimate information about members of the outgroup. In general, individuals may be less likely to self-disclose to outgroup members than ingroup members, which has the unfortunate result of limiting the amount of personal information explored in intergroup interactions and thus limits opportunities for making meaningful connections. Thus, personalization involves perceiving outgroup members in a more individuated and differentiated way but further includes a focus on information about an outgroup member that is relevant to the self. With personalized interaction, an individual’s characteristics rather than their group memberships becomes salient and can thereby undermine group stereotypes as a source of information about members of that group,³⁹ producing more positive attitudes toward their group as a whole. Greater

personalization through reciprocal self-disclosure, for example, can be an effective way to promote more positive intergroup attitudes and orientations.

Recategorization

An alternative approach to decategorization and personalization allows group boundaries to be maintained. This framework acknowledges the difficulty of eliminating perceptions of group identities and, instead of attempting to degrade group boundaries, seeks to change perceptions of the relationship between the groups in ways that facilitate peacebuilding.

Recategorization involves replacing the original categorization of members of different groups with a common overriding shared identity. The key idea of the common ingroup identity model, which builds on the principles of social categorization and social identity theory, is that intergroup bias can be reduced if group members conceive of themselves as part of an inclusive superordinate category. By redefining who is considered an ingroup member, processes that typically apply to the ingroup (e.g., ingroup favoritism) are redirected to the more inclusive category.⁴⁰ Thus, upon recategorization outgroup members may be accorded the benefits of ingroup status, including more positive thoughts, feelings, and behaviors. Because humans possess a common neural code for tracking coalitions that define who is a member of an ingroup or an outgroup, creating a sense of common identity can activate the same brain areas associated with ingroup responding—the dorsal anterior cingulate cortex/middle anterior cingulate cortex and interior insula—for people formerly categorized as a member of the outgroup on a different dimension.⁴¹

The creation of a common ingroup identity can occur in a number of ways. A common ingroup identity for members of different groups can be achieved by increasing the salience of existing common superordinate memberships (e.g., a school, a company, a nation). For instance, reminding members of different racial or ethnic groups within an organization or country that they share a company, regional, or national identity can make common identity salient and thereby improve intergroup attitudes. Another is to establish a sense of common identity through contextual interventions. One of the most powerful ways to do this is by creating conditions (similar to the Robber's Cave research of Sherif et al. described earlier)⁴² that require intergroup cooperation to achieve mutually desired goals. Cooperative interdependence creates more positive relations between groups in large part because it makes members of the two groups think of themselves in terms of a new superordinate identity.⁴³ Similarly, positive intergroup contact, even in the

absence of explicit cooperation, in which people exchange thoughts, feelings, or concerns, can bring people together under the umbrella of common identity.

Experimental evidence of intergroup attitudes in support of the common ingroup identity model comes from research using both ad hoc and real groups, with children as well as adults, and in the United States as well as in other countries.⁴⁴ For example, having two groups come together to collectively solve a problem of mutual concern (as with the two groups of boys in the Robbers Cave study discussed earlier) or encouraging students from different racial groups to think of themselves in terms of their shared school identity can establish or emphasize common identity, which in turn can ameliorate intergroup bias and conflict.

Common identity also promotes intergroup forgiveness and trust. For example, increasing the salience of Jewish students' "human identity," in contrast to their "Jewish identity," increased their perceptions of similarity between Jews and Germans, as well as their willingness to forgive Germans for the Holocaust and their willingness to associate with contemporary German students.⁴⁵ A shared superordinate identity has also been shown to affect responsiveness to others.⁴⁶ Group members are more accepting of a newcomer's innovation when the newcomer shares a superordinate identity with them than when the newcomer does not, and the strength of superordinate group identification is positively related to the extent to which group members accept the innovative solution. In addition, people are more responsive to the needs of former outgroup members perceived within a common ingroup identity across a range of situations, including emergency situations. People also have more respect for the lives of outgroup members, to the extent that they perceive commonalities with them.⁴⁷

It is important to recognize that the successful induction of a common ingroup identity does not necessarily eliminate social biases entirely; it may simply redirect them. When recategorization occurs and a superordinate group identity is established, other outgroups at the same level of inclusiveness are likely to be recognized as relevant comparison groups. Because of the need to establish, maintain, or enhance the positive distinctiveness of the superordinate identity, biases toward these groups are likely to be aroused. For example, consistent with the Common Ingroup Identity Model, East Germans who recategorized West Germans and East Germans within the superordinate national identity of "Germans" displayed reduced bias toward West Germans. However, adopting the superordinate German identity (compared with maintaining the East-West German categorization scheme), led German participants to become more biased over time toward

members of other countries.⁴⁸ In this respect, emphasizing common identity can be strategically used in destructive ways. It can improve relations and create allies among groups previously in conflict but produce more animosity toward groups excluded from the common identity. For instance, highlighting the shared threat of terrorism following the 9/11 attacks on Americans reduced racial biases between black and white Americans, but it potentially exacerbated biases of these American participants toward Muslims.⁴⁹ Thus, “recategorization is a two-edged process: Although it reduces conflict at the subgroup level, it may initiate conflict at the common ingroup level.”⁵⁰

As the previous discussion illustrates, both individual psychology and social relations between groups are multifaceted and complex. Strategies employed to reduce intergroup conflict and establish peace between groups in a lasting and stable way need to consider the specific nature of intergroup relations and possible unintended consequences in order to be “wise” and effective interventions. In the next section, we consider challenges to these psychological interventions and offer concrete suggestions for addressing barriers to effectiveness.

Intervention Challenges and Ways to Address Them

The ultimate, and realistic, objective of peacebuilding is to advance constructive, mutually beneficial, and self-sustaining forms of intergroup relations. In this section, we consider common obstacles and potential unintended consequences to category-based social interventions for peacebuilding. These issues relate to impediments to establishing common ingroup identity, as well as how to balance the unique needs, goals, and motivations of members of different groups when a superordinate identity has been established. For each issue, we suggest practical ways to overcome the barrier to effective peacebuilding, drawing on principles theoretically grounded in social categorization and identity processes illuminated by psychological and neuroscience research.

Achieving Common Identity in the Absence of Personal Contact

One of the most effective ways to improve intergroup relations is by creating opportunities for positive interactions between members of groups in conflict.⁵¹ Intergroup experiences that are positive and rewarding improve intergroup orientations more generally in part because they personalize members of the other group, reducing intergroup anxiety and physiological stress, and increasing empathy for them—in part because of the dis-

covery of commonalities between members of both groups. A wealth of laboratory and field research across a wide range of contexts supports the basic premise of contact theory, which proposes that intergroup contact can improve intergroup attitudes and relations.⁵² Recent neuroscience studies have also found that intergroup contact leads to less activation in regions of the brain associated with cognitive control, including the right dorsolateral prefrontal cortex, dorsal striatum, and ventrolateral prefrontal cortex. The attenuation of activity in these regions suggests a potential physiological mechanism in which intergroup contact may lead to the inhibition of ingroup favoritism and/or outgroup discrimination by inhibiting the cognitive activity that drives those types of behaviors.⁵³ Contact is most likely to be successful when it is structured to emphasize equal status, cooperation, and common goals, and when it has the support of authorities, law, or custom. However, the experience of positive intergroup interactions can improve intergroup relations even when the situation does not satisfy these conditions. These interactions can have a substantial, enduring effect on intergroup relations particularly when they allow people to form personal relationships across group lines. One reason why these interactions can have long-lasting effects is because these exchanges lead individuals to recognize the heterogeneity among people whom they previously viewed only in terms of their group membership, which weakens the meaning of the outgroup label for both cognitive and neural processes.⁵⁴ The establishment of cross-group friendships can also have cascading positive effects: When people simply learn that members of their group have friends in the other group, they also develop more positive attitudes toward the group.⁵⁵

Because the divide between different social groups can limit opportunities for direct intergroup contact, researchers from the realms of psychology, political science, and communication have considered how other forms of indirect contact can improve intergroup orientations, which can facilitate peacebuilding. Indeed, indirect forms of contact—including observing positive cross-group interactions (*vicarious contact*), mentally simulating positive contact experiences (*imagined contact*), and computer-mediated interactions (*virtual contact*)—also can reduce intergroup bias and conflict. In addition, mass media can potentially also play an important role. In the wake of the Rwandan genocide, positive vicarious contact between Hutus and Tutsis, portrayed in a radio soap opera in Rwanda, led listeners to perceive more positive norms about intergroup relations and produced more trusting, empathic, and cooperative intergroup orientations (although there was no examination of the neurological impact of these interventions).⁵⁶ Even though the effects of indirect forms of contact tend to be weaker than those of direct, personal contact,⁵⁷

they are still important for improving attitudes toward outgroups—especially in contexts where direct contact is rare, difficult, or nonexistent.

Creating Common Identity in Contexts of Conflict

Many of the factors that typically contribute to creating a sense of common identity between groups, such as cooperative interdependence, are sometimes ineffective for groups currently engaged in conflict or historically in conflict. Cooperation requires both parties to be trusting and trustworthy, both of which rarely exist in situations of intense conflict. However, it still may be possible to identify common ground between groups in other ways.

For example, in the activities and outcomes of a program of workshops designed to improve Palestinian-Israeli relations, the foundational understanding that needed to be established first was the existential interdependence of the groups: the long-term fates of Israeli-Jews and Palestinians in the Middle East are inexorably intertwined. The recognition of this common fate provided the platform for the Palestinian and Israeli participants to develop a common workshop identity. The activities in these workshops then focused on searches for solutions that satisfied the needs of both parties. This structure of the workshop changed relations between the groups from competition to cooperation with a common goal.⁵⁸

Whereas this approach focuses members of different groups on their shared fate in the future, an alternative—perhaps complementary—intervention for creating a sense of common identity is rooted in the groups' shared past experience, particularly in their shared experience of victimhood. Conflict between members of different groups is often reinforced by competitive victimhood, in which each group galvanizes its members against the opposing group by establishing that their group has suffered more than the adversarial group.⁵⁹ However, presenting credible narratives that emphasize inclusive victimhood that emphasize both ingroup and outgroup suffering, have been shown in Israel, the United States, and Turkey to reduce support for aggressive intergroup policies.⁶⁰ Such narratives promote feelings of universal inclusivity, grounded in the shared experience of suffering and sorrow, and facilitate intergroup forgiveness and, ultimately, reconciliation.⁶¹

Resistance to Commonality Because of Threats to Social Identity

Because, as we mentioned earlier, people are motivated to maintain the positive distinctiveness of their group relative to other groups,⁶² efforts to induce a common identity can sometimes be met with resistance that can increase bias between members of the original groups. When the integrity of one's group identity is threatened, people are motivated to reestablish positive and distinctive group identities and thereby maintain relatively high levels of intergroup bias or show increased levels of bias.⁶³ Consistent with this reasoning, introducing interventions such as emphasizing similarity or overlapping boundaries between the groups or shared identity can exacerbate intergroup bias as a way of reaffirming positive distinctiveness.⁶⁴ This effect is particularly likely to occur among people who value their original group highly, such as those more highly identified with their original group and when the initiative to form a superordinate identity is perceived to come from an outgroup rather than an ingroup member.

However, within the context of the common ingroup identity model, the development of a common ingroup identity does not necessarily require each group to forsake its less inclusive group identity. Social identities are complex; every individual belongs to multiple groups simultaneously.⁶⁵ Thus, depending on their degree of identification with different categories and contextual factors that make particular identities more salient, individuals may activate one or more of these identities simultaneously as well as sequentially. It is therefore possible for members to conceive of two groups (e.g., science and art majors) as distinct units within the context of a superordinate (i.e., university identity) social entity. In the United States, for example, participants who were induced to identify themselves as "European American," a dual identity, exhibited less bias toward American minority groups than did participants asked to identify themselves as "white."⁶⁶

Gateway Groups

The idea that people may activate more than one social identity at a time has additional implications for reducing intergroup bias and conflict. The previous section considered how the personal experience of a dual identity can reduce identity threat aroused by an intervention designed to promote common identity. In this section, we discuss how perceiving *others* as possessing a dual identity can facilitate more positive intergroup relations and contribute to peacebuilding among the perceivers.

Dual identity groups can potentially serve as a gateway between two, otherwise separate, groups.⁶⁷ From this perspective, the recognition of groups—termed “gateway groups”—that have both ingroup and outgroup components to their identity can allow people to envision more positive intergroup relations. The notion of gateway groups resonates with this dual identity construct in that the presence of a multiple-identity gateway group can be both a reminder for its counterparts of the similarity between the two separate groups, while at the same time help maintain each group’s distinction. Thus, for example, Arab citizens of Israel can bridge relations between Palestinians and Israeli-Jews. In the Israeli-Palestinian context, making the presence of the Arab-Israeli gateway group salient, and making the dual identity of the gateway group more explicit, led Israeli Jews to have greater motivation for contact with Palestinians, more generous resource allocation toward Palestinians, and diminished support for aggressive policies against Palestinians.⁶⁸

The notion of gateway groups has a broad applicability, potentially spanning very different group memberships and social categories. For example, race in many countries over the world has typically been treated as a dichotomy (e.g., black or white), with individuals challenging this racial dichotomy being likely to become socially excluded or even penalized.⁶⁹ However, in recent years a clear shift seems to be taking place toward an increase in both the presence and influence of biracial identity. Indeed, over the past fifteen years, the black and white biracial population in the United States has tripled in size, numbering over 2.5 million,⁷⁰ and the current estimate is that by 2050 one out of five Americans will be of mixed race. ERP studies examining exposure to biracial targets have recently found that racially ambiguous targets are not processed in the same manner as racial outgroup targets,⁷¹ and research investigating the potential of biracial people as gateway groups found that exposing white Americans to biracial people decreased racism and increased empathy of whites towards blacks.⁷² Moreover, the potential of gateway groups can be also found on a larger global cultural level. Countries such as Turkey or Albania can mediate between the Western world and the Muslim world, with which they are both identified,⁷³ and on a smaller scale situated in the midst of a specific ethnic group (e.g., between Ashkenazi and Sephardic Jews).⁷⁴

The positive impact of making gateway groups salient likely occurs through the way it changes social categorization processes. The unique position of the gateway groups can break the hold of existing social categories and diminish the perceived importance of existing group borders. In other words, if a group exists that shares both “our” and “their”

social category, then such a group can serve as a catalyst for decategorization processes. Alternatively, the presence of the gateway group, being situated in between the ingroup and the outgroup, can serve as both proof of the similarity of the two groups as well as the distinction between them, enabling an existence of a nonthreatening superordinate identity. In this respect, it is important to highlight the deep commitment of members of gateway groups to both groups comprising their dual identity in order to avoid the perception that dual identifiers have divided loyalties and are potential “traitors” to one’s ingroup.⁷⁵ Emphasizing dual identity groups as potential gateways that are connected to both relevant groups can have far-reaching implications in terms of improving intergroup relations across domains including interracial, international, interethnic, and interreligious relations.

Irony of Harmony

A common identity may sometimes be more effective for promoting social harmony (improved intergroup attitudes) than social or structural changes toward equality that are needed to produce stable and mutually beneficial intergroup relations. Specifically, a primary focus on common identity, because it reduces attention to other group identities and thus to group-based needs and disparities, can reduce attention of disadvantaged groups in particular, to structural inequality as it promotes positive intergroup attitudes. These positive attitudes and the apparent achievement of harmony can relax the motivation of disadvantaged groups to take direct action for social change that will help ensure peace in the longer term.⁷⁶ For example, stronger feelings of positive connections between Arabs and Jews in Israel was associated with Arabs’ more positive attitudes toward Jews and with reduced awareness of inequality between Jews and Arabs. Through its effects both on the reduced attention to inequality and increased perceptions of social harmony, Israeli Arabs exhibited a *decrease* in support for social change. These ideas are supported by a large and unique data set (N=12,997) recently collected across sixty-nine different countries, showing that while for advantaged groups intergroup contact predicts more support for equality and social change, for disadvantaged groups it predicts less support.⁷⁷ Given that the disadvantaged group is often the primary initiator of social change, their impeded awareness and motivation to act for change toward equality can impede peacebuilding, which involves the undermining of injustice and of group-based inequality.⁷⁸

Thus, although intergroup harmony is clearly a desirable goal in peacebuilding, how harmony is achieved is critical to ensuring positive intergroup relations in the future.

In this respect, recognizing dual identities can again be instrumental. To address issues of race relations in the United States, dialogue groups are a popular and effective intervention on college campuses.⁷⁹ This approach recognizes the kinds of misperceptions and miscommunications that commonly occur in intergroup interactions, and thus structures and facilitates these dialogues. Based on the assumption that the members of different groups enter these dialogues with a sense of shared university and national identity, dialogue groups strive initially to create greater understanding of the unique perspectives, needs, motivations, and feelings of members of different groups. The initial emphasis of dialogue groups is on acknowledging and respecting different group identities. Participants are discouraged from promoting superficial harmony; instead, dialogue groups focus on building skills for understanding others, appreciating differences, and then recognizing the mutual benefit for the common good of taking action to achieve social justice and equity.

The most effective sequence of emphasizing common, different, or dual identity may depend on whether intergroup conflict is current or past, whether groups already have some degree of common identity and sense of interdependence, and the goals, needs, and motivations of interaction partners. The key point, though, is that an initial emphasis on common or dual identity may not satisfy the needs of members of the different groups simultaneously. Reducing intergroup tension and promoting reconciliation are complex processes that require “staging” different interventions in sequence such that over time the unique needs of members of both groups are met and the interdependence and shared identity of the groups are recognized.

Summary and Implications

In the previous sections, we reviewed how the mere categorization of others as members of one’s own group (the ingroup) or another group (an outgroup) systematically biases how people evaluate others, what they expect of them, and how they orient themselves toward others as they begin to interact with them. These social categorization processes are fundamental to how people think about, feel about, and behave toward members of their own group and other groups. Some scholars have argued that these processes are deeply rooted in human evolution; neuroscience evidence clearly documents that these effects run deep, grounded in brain and physiological responses to others. Although mere categorization may provide a foundation for bias to develop, historical conflict between groups further shapes the specific nature of contemporary intergroup relations and biases. Nevertheless,

while these mechanisms may predispose people to intergroup conflict, this conflict is not inevitable or unmanageable. Understanding the psychological and neurological processes involved in intergroup conflict can critically guide efforts in peacebuilding.

It is possible to develop interventions, tailored to the nature of historical and contemporary intergroup relations, to reduce intergroup tension, improve relations, and promote stable and lasting reconciliation. Importantly, developments in social neuroscience can not only help expand the theoretical understanding of the psychological processes driving intergroup conflict, but also aid the evaluation of the psychological influence of conflict resolution interventions. For instance, neuroscience has been recently used to evaluate the impact of psychological interventions in the form of mental training (e.g., meditation-based interventions including present-moment-focused attention, acceptance of difficult emotions, and perspective-taking involving the self and others). These studies found that such interventions attenuated the physiological stress response, specifically the secretion of the HPA axis end-product cortisol, by up to 51 percent,⁸⁰ increased cortical thickness in prefrontal regions, induced plasticity in frontoinsula regions, and changed inferior frontal and lateral temporal cortices.⁸¹ These regions are associated with socio-affective and socio-cognitive brain networks, and relate to social intelligence, pro-social motivation, and cooperation.

The key idea of the common ingroup identity model is that factors that induce members of different groups to recategorize themselves as members of the same, more inclusive group can reduce intergroup bias through cognitive and motivational processes involving ingroup favoritism.⁸² However, whether recategorization in terms of a single superordinate identity or dual identities is effective depends significantly on the historical and contemporary status of the groups, whether intense intergroup conflict is past or ongoing, and the way intergroup interactions are structured. Although intergroup contact has significant potential for improving intergroup relations, unmanaged intergroup interaction also has the potential to escalate intergroup conflict. Appreciating the potential benefits of targeting social categorization processes in peacebuilding, the practical challenges to creating common identity, and strategies for addressing these challenges can help provide a broad range of tools for effective peacebuilding.

Notes

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A Neurobiological Understanding of How Rituals Can Support Peacebuilding Processes

*Béatrice Pouligny,
with Dara Ghahremani and Matt Rossano*

Sierra Leone, in the early 2000s. *The country has just reached the end of a long and brutal civil war. While an official demobilization, disarmament, and reintegration program of ex-combatants is under way, with mixed results, local communities start organizing purification and reintegration ceremonies. The ceremonies follow local customs but also are, at times, infused with Christian or Muslim traditions (at times with readings from both the Bible and the Quran as part of the ceremony). Although they vary from one community to the next, the rituals typically include apologies, acts of purification for the former combatants (some of whom are minors), and the cleansing of entire sites or buildings, and are always concluded by the sharing of food (for instance, a glass of water and kola nuts). Most observers retrospectively consider that the ceremonies did more to support reconciliation than any of the official—more conventional—programs.*

Standing Rock Indian Reservation, North Dakota, United States, April 2016. *Protests have started in reaction to the approved construction of a pipeline in the northern United States that threatens the region's clean water as well as sacred lands, including ancient burial grounds. The movement starts on April 1 with a nearly thirty-mile prayer ride on horseback. Afterward, communal prayers continue to be held in the morning and evening and at mealtimes; prayers are held in vigils and in songs, while sage, cedar, and tobacco are being burned. In those gatherings, the Standing Rock Sioux invite all people to join. Representatives of other tribes as well as those of different religious denominations join in solidarity with their own sets of practices. Most visitors and supporters who came to Standing Rock have highlighted the role that those constant rituals played in the resistance, as a core mobilizing and stabilizing force for the movement. As in any large decentralized gathering, there are conflicts, but all observers describe the overall unity as remarkable.¹*

War is ritualized in many ways. We need to do the same with peace, at the individual and collective levels, in order to mark the importance of a transformation that is not only external but also deeply internal, at least if it is to be sustainable. In Sierra Leone, for large numbers of irregular combatants, the ceremonies organized by local communities were the only process of reintegration they ever underwent. For many of them—in particular, those known as *Kamajors*,² the largest and most powerful of a heterogeneous group of ethnic paramilitaries loosely allied under the umbrella of the Civil Defense Forces (CDF)—ceremonies were crucial as an echo to the rituals they went through during their training and induction in the militia during the war. Entering the militia was ritualized as a transformation. The *Kamajors* were famous for their hunting regalia (clothes, headdresses, protective amulets), which were meant to transform the wearer, heating his heart to the point that he becomes something more than himself, and even more than human. Ritualizing the process of coming out of war was therefore particularly crucial for this group. This example is not unique. Even veterans of more conventional armies often point to the striking contrast between the many ritualized practices that they went through both when recruited and during their time in the army, and how little their return from a mission (or discharge) is ritualized. The main exception comes from Native American communities who have ritualized practices for reintegrating warriors—the sweat lodge being one of the more well known. Similar rituals can go a long way in empowering and transforming communities for actively waging peace.

From the beginning of human existence, cultures have developed their own ritualized practices—whether they are considered as religious or secular experiences, or both. Ethnographic research has shown the multiple roles these practices play in regulating socio-emotional responses and supporting healing. Further, some of them have sparked deeper individual and collective transformation, helping communities to transform fear and trauma and to move away from violence and separation. These practices are part of a vast reservoir of human knowledge, yet are too often ignored or forgotten in peacebuilding processes, as they might be less familiar to Western cultures.

This article argues that a better understanding of the potential and limits of rituals from a neurobiological perspective can help leverage existing peacebuilding resources present in every society as part of the human condition and wiring. Rituals engage individuals and communities *where they are* with nuanced, diverse, and culturally embedded practices, which both transcend and complement standardized approaches to peacebuilding.

At the most fundamental level—that of the brain—rituals offer opportunities for the rewiring and cowering of neural circuits, helping prevent violence, and building compassionate and resilient individuals and communities. The first part of this article reviews existing research showing the role of rituals in supporting the regulation of emotions, sculpting cognitive control, and refining explicit attentional and memory processes, all functions that facilitate positive interactions among individuals. The second part explores the paradoxical role spiritual and ritualistic practices can play in either alleviating or exacerbating intergroup bias and us vs. them thinking and suggests ways to bypass these difficulties, based on neuroscience research. The third part suggests concrete applications for the peacebuilding field.

A few definitions might help clarify the framework for our exploration:

Ritual: In this article, we understand ritual as referring to a stereotyped and generally invariantly sequenced pattern of behaviors that are both meaningful to the participant and designed to send a message to the other participant(s), when the ritual is collective. All participants in the rituals understand what they are doing (hence the variety of scripted, ceremonial, and symbolic activities that happen in a certain sequence).³ Rituals can be considered on a *spectrum*: on one end of the spectrum, behaviors are becoming more focused and more predictable, which means that they are becoming more ritualized; on the other end, there is more spontaneity in the behaviors. Furthermore, rituals are understood to have both bottom-up (attention-biasing) and top-down (meaning-making) aspects, both of which can affect emotional and behavioral responses.⁴

Spiritual and cultural: Special attention is paid to spiritual and cultural rituals at large because of the specific support they can provide in terms of brain rewiring. In this article, we refer to spirituality as it transcends the normal parameters of organized religions, suggesting a less bounded and, at times, more far-reaching scope of human involvement and human experience. 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. Spirituality is part of wider cultural systems that mediate both violence and its impact, as well as community resilience, during peacebuilding processes. It is a notion that is inherently heterogeneous, encompassing moving realities conceived in different meaning systems (i.e., cultures). A sense of transcendence is generally associated with the notion of spirituality. Spirituality has been referred to as the idea that one's life fits within a larger cosmic order or purpose.⁵

The goal of this article is not to identify one specific set of cultural or spiritual practices as the best avenue for supporting peace. Instead, we seek to promote a better understanding of how the wide diversity of spiritual rituals that are an integral part of different cultures and communities around the world affect brain processes and how, and under what circumstances, they can be leveraged to contribute to the transformation of behaviors, attitudes, and relationships to support peace.

Rituals, Emotion Regulation, and Enhancement of Cognitive Control

There is a substantial body of research in psychology and neuroscience demonstrating how rituals can help regulate one's emotions, sculpt cognitive control, and refine explicit attentional and memory processes, all functions that facilitate constructive interactions among individuals.⁶ Cognitive control is here understood as the process by which goals or plans influence behavior. Also called executive control, this process can inhibit automatic responses and influence working memory. Cognitive control supports flexible, adaptive responses and complex goal-directed thought.

The Regulation of Stress-Related Biological Responses through Explicit Top-Down Control over Limbic Networks

Significant research has been conducted on the correlations between attentional control and ritual, with important dimensions such as the inhibition of pre-potent defensive responses (i.e., support of self-mastery) or the transformation of memory and negative emotional affect. Rituals focus attention on a selected behavioral or sensory signal at the exclusion of other competing signals.⁷ Generally speaking, by engaging in a rule-governed, predictable, routine-like behavior, one helps to train mental focus. Recent studies have shown that individuals well versed in focused attention (e.g., long-term meditators) can volitionally decrease activity in the brain regions associated with mind-wandering and distraction.⁸ Other studies have also suggested that ritualized prayer (to take the example of a ritual of an explicitly spiritual nature) increases attentional control in tasks with no moral or religious association.⁹

Another effect of rituals is to free processing 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.¹⁰ 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.¹¹ 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.”¹² This last point is particularly salient as increased cognitive load undermines attentional control and executive function in individuals with acute stress disorder.¹³ Long-term focused attention on the present moment has been shown to produce changes in areas of the brain associated with self-awareness and support emotion regulation, inhibiting potentially detrimental emotional reactions to stimuli—in other words, greater control over stress responses.¹⁴

Both dimensions (attention control and emotion regulation) are at the heart of why the Colombian-based not-for-profit Fundación para la Reconciliación puts so much emphasis on rituals in its work that centers on forgiveness with both perpetrators and victims—and their communities. The practices are based on traditional rituals present in Colombian culture with some influence from Christian rituals that help symbolize the transformations that participants are going through. For instance, “Going from Darkness to Light” symbolizes the possibility of transforming rage and pain. Another ritual with water symbolizes the clearing of the past (“The Liberation”) and the desire to move forward. These rituals contribute to the development of constructive responses and pro-social skills. For the participants, the reward is in the progressive transformation of pain and fear. A lot of the work is about giving a new meaning to people’s memories. Forgiveness, in this specific context and perspective, does not change the past, but it changes the present and the future.

We can find an echo of these experiences in the way mediums and traditional healers (*kimbanda*) in Mozambique helped with the peaceful reintegration of former combatants and former child soldiers, through purification rituals involving the whole community. By “tak[ing] the violence out of the person” and purifying after what was perceived as “pollution,” they made it possible not only to designate and describe the period of violence as “abnormal” and “unacceptable,” but also to redefine the rules indispensable for the group’s coexistence and survival. The detailed accounts of these practices by local anthropologists allow us to hypothesize that, indeed, in these cases as well, rituals may have played a powerful role in regulatory control, both for the individuals directly concerned and for the community members who always had an active role in the process.¹⁵ As

also exemplified in the Colombia experience, meaning-making is also a crucial part of this process, a dimension that we still have much to fully understand from a neurobiological perspective (see the subsection on meaning-making).

The Role of Mind-Body Connections Present in Many Spiritual Rituals

Breath plays an important role in many of the spiritual practices observed across cultures. It is particularly interesting from a neurobiological perspective as it happens to also play an important role in engaging and regulating the autonomic nervous system.¹⁶ Across cultures, many practices also involve very active body movements, such as singing, chanting, dancing, and the playing of percussive instruments. These types of activities help to regulate the nervous system. Recent studies have also shown significant links between the practice of mindful breathing and reductions in anxiety.¹⁷ Intentional breathing has also been shown to be an effective intervention for depression among war veterans and battered women suffering from PTSD.¹⁸ One study has shown improvement in PTSD symptoms in veterans who took a controlled breathing workshop, with effects persisting six months later.¹⁹

More generally, the connection between the mind and body has now been largely researched in the context of trauma healing and stress reduction (see the articles on trauma in *NeuroPeace* no. 3). Within the different disciplines that study the brain, researchers have shown that contemplative practices such as mindfulness and other forms of meditation, prayer, yoga, and breathing techniques can have long-term (lasting months or even a year) effects on memory, emotions, and chronic stress.²⁰ Recent studies have also found that interoception (the conscious 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.²¹ Studies drawing on clinical observations from somatic experiencing practitioners²² and their work with PTSD treatments, suggest that bodily awareness through interoception can engage implicit memory and, by extension, can provide access to traumatic memories stored within the body.²³

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 system—i.e., the fight or flight reaction).²⁴ Studies have started to explore how contemplative practices might help relieve some of the traumatic symptoms.²⁵

Although most existing research has focused on practices familiar to the West (e.g., certain forms of meditation and yoga), those benefits can be found in a wider repertoire of practices familiar to communities. *Dhikr* (also known as *zikr*, meaning “remembrance”) is a good example. The name refers to a devotional practice in Islam in which short phrases or prayers are repeated aloud or within the mind. They are counted on a set of prayer beads (or *Misbaha*), comparable to the rosary of Catholic tradition or Japa Mala of Hindu tradition. In some Sufi traditions, *dhikr* involves chanting, repetitive movements of the head and body, or dancing. When asked about their self-care practices and what supports them most in their daily life, a fair number of Syrian refugees name *dhikr*. It has a lot in common with forms of meditation that involve the repetition of mantras in Buddhism and Hinduism. The breath is also very present in some of the practices, and so are the repetitive movements of the body—all aspects that have been widely studied in different forms of Westernized forms of meditation and yoga and shown as having important impact on stress levels and PTSD symptoms, but very little in the context of *dhikr*. As a consequence, the unfortunate tendency of outsiders has been to implement (although to a limited extent) programs that involve Western forms of meditation and yoga, instead of looking at these local practices that are already familiar or a part of people’s lives. We further address later in this article the overall issue created by the Western appropriation of Eastern practices that are then repackaged and exported into other cultures.

Rituals, Social Bonding, and the Risks of Outgroup Exacerbation and Their Mitigation

The Historical Role of Rituals in Facilitating Social Bonding

It has also been demonstrated that rituals have a deep history of facilitating social bonding.²⁶ As highly social animals, primates have an extensive range of social rituals designed to build trust, promote group harmony, and reinforce social relations.²⁷ In their case, the effectiveness of rituals in building social relationships has been traced to two important functions: (1) rituals focus attention on a particular behavioral or sensory signal at the exclusion of other competing signals, and (2) rituals inhibit immediate pre-potent defensive responses long enough to allow slower social-emotional processes and social-bonding mechanisms to operate.²⁸

Evolutionary psychologist Matt Rossano notes: “Looking across a range of traditional societies, three types of social rituals are common when it comes to enhancing

within-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.”²⁹ Similar rituals occur in many postconflict situations and have been reported to support community resilience, as exemplified in the cases of Colombia and Mozambique mentioned above.³⁰ Other examples include rituals of baptism used in the Yazidi community in Iraq to help heal the female returnees who had been sexually enslaved by Daesh, a case that however still needs to be seriously documented.

Social bonding is an important component of what occurs in those contexts. A number of studies have demonstrated that social bonding is linked to the production of oxytocin and vasopressin, both of which have been linked to the mitigation of stress responses.³¹ Social bonding can, in turn, support the development and practice of norms and values favoring peace.³²

A general assumption is that human beings evolved alongside the development of ritualized behavior; rituals allowed humans to sustain motivated cognition and behavior critical to the survival of one’s own group, to facilitate contributions to ingroup welfare, and to defend against outside threats, including competing groups.³³ Here, the crux of the discussion is around enhanced ingroup identification, often brought about by shared socio-cultural and/or ritualized experiences. For instance, previous research has linked ritual and religious practice toward the solidification and strengthening of one’s social identity.³⁴

Rituals and the Risks of Intergroup Bias Exacerbation under High Stress

Therefore, while there is tremendous opportunity for the promotion of prosociality via the ritualized experience, there is also the very real and well-documented danger of the way in which enhanced ingroup loyalty and identity can be associated with exacerbated outgroup antagonism and violence.³⁵ Indeed, exaggerated ingroup identification has psychological and neurobiological underpinnings that can not only lead to less empathy for outgroup members (relative to ingroup members) but also produce a pleasure response to outgroup suffering.³⁶ Perceived group membership modulates the neural responses underlying empathy by reducing intergroup empathy while increasing outgroup bias and rewarding outgroup member pain (*schadenfreude*).

Here, it is important to note that group identifications shift constantly, making those dynamics susceptible to redefinition. Particularly in the most violent situations, group identifications and allegiances can fluctuate very rapidly depending on circum-

stances. Previous research has demonstrated distinctions among primary, secondary, and even tertiary dimensions influencing personal identity, underscoring how fluid those elements can be.³⁷ This is a dimension that should be taken into consideration in any discussion around the risks associated with rituals. Although these fluctuations bring complexity, they also allow for flexibility and openness as with the possibility for soliciting alternate identifications in a ritualized manner to reengage beyond the boundaries of any given identity group.

However, the core issue, from a peacebuilding perspective, is less explicit than implicit bias. As noted earlier, significant research has been conducted on the correlations between attentional control and ritual, but there has been little exploration into how this ritually supported attentional control affects implicit bias responses. While much of the literature on attentional control and executive function addresses the inhibition of impulses³⁸ or the suppression of memory and negative emotional affect,³⁹ the role of attentional control in moderating implicit processes—for example, implicit bias reactions and other types of inflammatory responses that could feed into violence—remains largely unexplored. This is especially important for the field of peacebuilding, where stressful situations or episodes of interpersonal violence tend to reinforce implicit biases and undermine the work of building lasting peace. Those of us who have worked in the field of peacebuilding for a long time have countless stories of individuals who might go through weeks of training of different kinds to help them see members of another ethnic group as human beings and not as enemies, only to have these deep-seated implicit biases immediately reassert themselves in moments of stress or adversity. In this sense, the implicit bias is never truly extirpated but is rather “controlled,” for better or worse. For instance, it has been demonstrated “that individuals with high or low executive control are believed to have the same experience of bias, but those with poor executive control are more likely to be perceived or behave in prejudicial ways.”⁴⁰ Moreover, it has been also proposed that instantaneous bias responses are likely mediated by executive processes that are not consciously monitored.⁴¹ Social psychological literature addressing reflexive control through implementation of intentions suggests that unintentional forms of discrimination may indeed be mitigated through proper application of intervention design.⁴² However, the specific ways in which neurobiological mechanisms underlying implicit bias are impacted by independent interventions focused upon intentional control are not well understood. Understanding these processes via further studies would help programs focus on which aspects of implicit bias programming—in this case, activities oriented around intentional control—most effectively target and mitigate intergroup bias.

Herein lies a critical disconnect in the existing research: ritual practices have the power to either alleviate or exacerbate intergroup bias and us vs. them thinking. The question is: What separates the two? What are the differences between otherwise analogous ritual forms (e.g., chanting, praying, movement) that lead to two very distinct results? More research, both in the lab and in the field, is desperately needed so that we can better grasp that question. Indeed, for the peacebuilding community, understanding how stress and adversity affects the attentional control of implicit biases is of primary importance. We believe that there is a strong potential in uncovering how ritual practice can help bring these implicit biases out of unconscious activation and under cognitive or attentional control, and whether this ritually supported cognitive control can be strengthened such that individuals can mitigate bias reactions even under extreme stress. One potential, tangible research approach would be to employ established aggression tests, such as those demonstrated by Bushman et al., as a postritual assessment among research subjects who are ingroup/outgroup members in order to measure the efficacy of ritual interventions.⁴³

Meanwhile, existing research offers some promising avenues as to how outgroup effects could be at least mitigated through ritualized gestures and experiences: first, by engaging neurobiological underpinnings of safety and trust; and second, through the relationship between synchronous activity (in particular, synchronized movements) and social rapport.

The Role of Rituals in Creating Predictability and Safety

Prediction is an essential feature of brain function. The brain constantly tries to predict the world and minimize cost. To minimize costs and save energy (i.e., to avoid spending time and energy to encode every instance of a stimulus or experience as new), the healthy brain primarily bases its work on predictability, not reactivity. Therefore, emotions in the brain can be seen as a function of the predictability of a situation.⁴⁴ Indeed, in theory, predictability is relaxing and stress free to the brain (reducing stress hormones such as 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 hypothesis here is that the predictable structure and well-defined roles within a ritual allow the brain to relax, allowing the individuals to settle peacefully into themselves as well as the group dynamics.⁴⁵ This sense of relaxation enables 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. Research has shown, for instance, that under stress (as measured by cortisol level), people tend to be generous only to the people they already know. In other words, there seems to be a correlation between cortisone level and the amount of generosity, or “emotional contagion” in subjects tested. But some experiments have shown that the reduction of stress through a shared ritualized experience can contribute to reversing this process, allowing people to expand their generosity.⁴⁶

Being in a safe environment—feeling safe—is a particularly important dimension for individuals living in violent conflict zones: they suffer from trauma or are under high chronic stress, and may live in a constant state of danger, with their flight or fight response always on. Feeling safe allows for the activation of the parasympathetic nervous system (the rest and digest system), which affords healing and reconnection for self and others. It also allows the prefrontal cortex of the brain to engage in slower evaluatory and decision-making processes.⁴⁷ Safety can be considered as a by-product of rituals, but it can also be intentionally created as its core component. The lead author of this article has personally witnessed how, in many environments where physical security remained an issue, ritualized gestures could help build a symbolic safe space for individuals and groups at every step of a gathering. Space matters, and place matters. Finding ways, with the people concerned, within their own cultural and spiritual repertoires, to mark the boundaries of a space can drastically shift the atmosphere of a meeting, symbolizing the fact that something different can happen, almost out of the ordinary life. Calling the Four Directions (East, South, West, and North), the Four Elements (Earth, Water, Fire, and Air), the energies from above and below, and placing stones on the ground (or any other natural object that speaks to the people concerned) to delineate a safe space is, for instance, part of indigenous rituals across cultures and traditions, with some variations and nuances and different meanings attached to each polarity. Asking local people about the way they refer to those universal cardinal points, and finding simple ways to “bless” the space in which a transformative gathering is going to happen, can be powerful. In the work of the Fundación para la Reconciliación, some of the rituals are designed to help participants progressively build a rapport as well as create and maintain a safe environment among former enemies, victims, and perpetrators. In the preliminary stages of the research on these experiences, participants have been reporting changes in their physical and mental well-being, because of the new sense of safety they are able to experience.

An experience of spontaneous ritual while opening a dialogue among Syrian refugees, in a very tense environment in Jordan, shows that rituals for creating a safe space can be very simple yet powerful. The individuals in the room had recently fled Syria, with all the traumas and intense stress that one can imagine. Nobody would talk, and it was clear that there would not be much of a dialogue. Marc Gopin, a well-known scholar and practitioner in conflict resolution, recalled his experience opening the meeting by passing some figs that he had just brought back from Jerusalem, framing this offering as a blessing to every single person in the room. As the figs went around, each of them expressed a blessing and a deep intention that allowed them to bond at a very deep level, through both their pains and hopes, in a highly emotional ritual. Rituals can (and often do) borrow from other cultures and spiritual traditions (in this case, Judaism, while the audience was Muslim and Christian), relying on universal symbols that can speak across traditions and help build relationships.⁴⁸

The role of rituals in creating a safe space for healing and transformation has been highlighted in various research on Alcoholics Anonymous groups, and it also seems to be playing a role in a number of traditional ceremonies studied outside of the Western world.⁴⁹ In group settings, ceremonies can help survivors reclaim a space (both symbolically and physically) in the community, so that they can come to terms with that feeling of being “lost.”⁵⁰ The sense of “safe space” is also constituted by the sense of time and presence manifested by the fact that time is devoted to honor the individuals present in a gathering, a sharp contrast with the way people may feel rushed by outsiders in more conventional settings.⁵¹

Another potential way that rituals can expand a sense of safety is through the act of surrender to a higher order or something bigger than oneself. This act of surrendering is common to twelve-step programs, and initial research has been published on the study of the impact of prayer on reducing alcohol craving (a stress response) that suggests that the brain activity of surrender is inversely associated with the physiology of the flight-or-fight response.⁵² It is possible that, through the act of surrender, an individual experiences a change in the autonomic nervous system whereby the perceived danger is removed and replaced by a sense of trust in a higher power. Its by-products generally are an increase in self-awareness, calmness, clarity, and trust.

To some, it might sound inconceivable to create a “safe space” in contexts where constant insecurity prevails. Yet, people do it, on the ground, in the middle of war zones or in refugee camps where security is far from being perfect. By no means does this replace

the need for physical safety but it is a crucial element, particularly for people who are constantly under high stress. It is also important to be aware of potential misuse and abuse of such practices. There have been, in different contexts, extremist groups (such as the Lord's Resistance Army in Uganda) abusing rituals and leading combatants to falsely feel a sense of spiritual protection and immortality. This constant reminder of what Scott Appleby has called the "ambivalence of the sacred"⁵³ has become a second nature for scholars working on religion, violence, and peacebuilding. It certainly needs to be kept in mind by peacebuilders, but should not prevent us from looking into complementary ways to support people when they try to transform their circumstances. The last section of this article offers concrete suggestions to face the challenges created by this ambivalence.

The Role of Rituals in the Process of Meaning-Making

Ethnographic research has pointed to the role of rituals in enhancing resilience through finding some meaning even in suffering and loss.⁵⁴ This is particularly important in war and postwar environments as interpersonal violence tends to change the way individuals think of themselves in relation to the group, and the forms and meanings that constitute "community."⁵⁵ In some qualitative psychosocial assessments, when interviewees talk about the effects of their past experiences, they do not refer to their trauma in individual terms but in reference to a collective self. They speak about distress within the social body, rather than the individual body or self.⁵⁶ In such contexts, rituals can help make sense out of what has happened and contribute to the adaptation of the systems of meaning, forwarding the process of building resilience. As exemplified by rituals of healing and purification in Mozambique and Northern Uganda, ruptures in the meaning systems need to be (re)interpreted and new narratives need to be constructed about the past and the future.⁵⁷

This is certainly an important dimension for peacebuilding, yet a neuroscientific understanding or framework that incorporates these important aspects of ritual has not yet been formed. The mediation of meaning-making is recognized as crucial, but it is also very highly individualized insofar as interpretative processes in the brain can vary across individuals. So far, the meaning-making process has been mostly studied in the context of language and semantics, which is already a complex area of exploration from a neurobiological perspective. In the current state of the research, we know that widespread cortical activity and cortico-cortical long-distance connections provide the machinery for holding together and integrating semantic representations. However, different brain

regions make specific and distinct contributions to meaning processing, as evidenced by area-specific signatures of semantic category-specific impairments and activations. Future research will be needed to further scrutinize the differential contributions of cortical areas to semantic processing and especially their functional interplay in symbol and construction understanding and in the context of ritual-derived meaning generation.⁵⁸

What does that mean for the peacebuilding field? Probably an invitation to be cautious when one anticipates the role of a particular ritual in meaning-making as it is mediated by a series of largely still unknown brain processes that are likely to be very individualized. In the meantime, more insights might come from research projects that have focused on the experience of transcendence and the surrender to an associated wider dimension. Indeed, it generally comes with an experience of meaning-making that is focused on universal principles. Surprisingly enough for the novice, research on the placebo effect might offer the most insight in this context as it provides an understanding of the impact of belief at the level of individual human brains. 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.⁵⁹

The Role of Ritualized Gestures and Experiences in Engaging the Neurobiological Underpinnings of Trust Beyond the Boundaries of a Given Group

Increasing trust is an essential dimension for peacebuilding. Achieving a certain level of trust can lead to individuals and groups choosing cooperation over confrontation. Much of the literature on the neurobiology of trust involves considerations around neuroactive hormones⁶⁰ and the neuropeptide oxytocin,⁶¹ where oxytocin drives a “tend and defend” response promoting ingroup trust and cooperation, and defensive, but not offensive, aggression toward competing outgroups.⁶² Other neurobiological work has focused on the role the insula plays in the expression of interpersonal trust.⁶³ The ability to build mutual understanding around shared rules is generally considered crucial to achieving a certain level of trust that can lead to choosing cooperation instead of confrontation.⁶⁴ By cooperating with others, we expend less energy to meet our needs than if we were constantly fighting with others; humans as a species therefore tend toward cooperation.⁶⁵ However, the circle of others that we are naturally inclined to cooperate with is limited by trust. If we cooperate with others, we must trust that they will respond in kind and equitably share the benefits from our cooperative efforts.⁶⁶

Building on existing research, it is possible to identify certain mechanisms within rituals that can help build trust, not only inside the group, but also outside as they support prosocial behavior toward outgroup members. Interestingly, recent psychological work has pointed to the role played by the *perception* of certain moral characteristics in promoting ingroup membership, where perceptions of one's moral character (e.g., honesty and trustworthiness) was viewed as more important than their social character (kindness or likableness).⁶⁷ In this way, the perception of one's moral image (i.e., trustworthiness) could be construed as more impactful than the experience of trust itself. Here the question is whether the development of actual trust vs. perceived trust could be more impactful for intergroup peacebuilding practices.

In that respect, it is possible to envision that ritualized gestures can facilitate the establishment of trust across group boundaries. For instance, studies have shown that predictable language patterns create neural coupling between speaker and listener.⁶⁸ This language can be verbal, but can also correspond to ritualized gestures serving as a “common language” that can, under controlled circumstances, facilitate understanding across groups and even cultures. Some of the existing research leads us to think that ritualized gestures could be used to convey peaceful, benevolent, or nonthreatening intentions.⁶⁹ Rituals can also reinforce an ongoing intention to sustain hope, well-being, and compassion toward others, whether the subjects of these intentions are part of the ritual itself or not. Research has indicated the potential of prayer, meditation, and other mindful activities to ameliorate intergroup bias and division by increasing interpersonal forms of altruism and decreasing parochialism.⁷⁰ The protection of sacred waters was at the core of the Standing Rock mobilization and of many rituals that were organized there. One day, members of the Indigenous Youth Council took water up to the barricade that prevented access to pipeline construction. The young people offered the water to the police who stood on the other side. Two of the officers refused, but one took some water and intentionally spilled it onto his shirt, over his heart. Then, across the barricade, the police officer and the water protector bowed their heads and prayed, together. This was a crucial moment in deescalating the tensions between police and demonstrators.⁷¹

Synchronicity in Rituals, the Expansion of Ingroup Silo/Identity, and Transformation of Outgroup Rapports

Many collective rituals are designed to facilitate prosocial behavior.⁷² Recent studies have explored the process of *identity fusion*, whereby participants in collective rituals expe-

rience a fusing of the personal and social self and, as a result, feel a sense of combined agency and a strong motivation toward pro-group behavior.⁷³ These studies echo similar findings that group rituals have a tendency to promote cooperation among ingroup participants,⁷⁴ and that the process of activating mirror neurons through mimicry has long-lasting effects on pro-group behavior after the period of mimicking has ceased.⁷⁵ This would tend to indicate that, as witnessed in Colombia, participants who have gone through important ritualized experiences together, over a period of time, not only continue to interact once the process is over but commit to work together for peace, even though they entered the process as “enemies.”

One particularly interesting line of inquiry in extending those effects beyond any group boundaries 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. Several experiments have shown that rituals involving such synchronous actions are effective in increasing rapport among group members, the sense of empathy and perception of similarity among participants, and promoting social cooperative behavior.⁷⁶ Research on a fire-walking ritual in the small Spanish village of San Pedro Manrique has taken this one step further by looking at synchronized arousal between performers and spectators, even in the absence of synchronized action.⁷⁷ In the fire-walking ritual (which happens every year, at the height of summer solstice), 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 apparent similarity to nonrelated spectators; this finding is confirmed in a similar study conducted on collective Hindu firewalking rituals in Mauritius.⁷⁸ However, in this latter 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 shown that synchronous movement and collective ritual not only can yield a higher tendency toward prosocial behavior among co-performers, but also can increase prosociality toward non-performers and outgroup members as well, at times creating a sense that individuals are part of a larger social whole.⁷⁹

A large body of literature has investigated the neuroanatomical underpinnings of *theory of mind*, understood as the underlying capacity to reason about one’s own and others’ mental states.⁸⁰ This literature extends in a multitude of directions, not the least

of which includes its application in decision-making,⁸¹ social conflict,⁸² and morality.⁸³ Recently, behavioral research has sought to investigate ways in which theory of mind might be enhanced through behavioral synchronicity. Here, investigators argue that behavioral synchronicity decreases the perceived psychological distance between individuals. In turn, social cognitive processes are increased, thereby promoting reflexive mental state reasoning as well as explicit tendencies for empathy and perspective taking.⁸⁴ To date, however, very little research has been conducted investigating the interplay between the theory of mind network and the potential prosocial benefits of behavioral synchronicity between groups.

Moving forward, the hope is that further research can build on these results and expand experiments to other scenarios, in particular to people who are not necessarily strangers but are in conflict or have history together. How much could a ritual contribute to building positive (or at least non-hostile) rapport between rival gangs in a given neighborhood? How much could this translate into their attitudes and behaviors?

Rituals in Peacebuilding Processes: Practical Applications from Neuroscience Insights

As mentioned at the beginning of this article, the goal here is not to identify one specific set of spiritual rituals that should be applied for every aspect of peacebuilding, but rather to invite a better understanding of how the wide diversity of rituals that are an integral part of different cultures and communities around the world can affect brain processes and how they can be leveraged to contribute to the transformation of behaviors, attitudes, and relationships to support peace. There is still a lot that we do not know or that remains hypothetical at this stage. Neuroscience is a field still in its infancy in many respects, but knowledge is developing fast and there is a lot that peacebuilders can learn from what already exists.

Attending to the Four Key Functions That Spiritual and Cultural Rituals Can Fulfill

Self-care and self-regulation: It should be noted, from the outset, that ritualized practices are particularly important in contexts where, almost by definition, the level of trauma exposure and chronic stress is high among the population and is often com-

pounded by the pressure of unmet needs and social breakdown. Numerous interacting social, psychological, cultural, and personal biological factors influence whether individuals develop psychological difficulties or not, in response to hardship, and how they conceive of trauma.⁸⁵ In other words, not everyone is necessarily suffering from trauma; however, almost everyone is under high stress. Now, stress can support growth and change, but when improperly managed or when the conditions are extreme, stress can be very destructive. Many experiences in conflict environments have shown how blindness to the mental health and psychosocial needs of a population can also sabotage other interventions, such as livelihood programs, as well as peacebuilding programs.⁸⁶

Self-care practices are important both for peacebuilders and local people. Daily rituals can play a crucial role in that respect. In addition, introducing rituals that support self-regulation can be highly influential when individuals are in a situation where they are intended to learn, dialogue, or otherwise engage deeply in peacebuilding activities. Any form of self-regulation will help them be less reactive and increase neural resources that allow them to be fully present to what is happening in the moment and process it more constructively. Relying on ritualized practices familiar to the individuals and groups concerned, and that make sense to them, is also a way to support them in continuing to use them in their daily lives, progressively building their personalized resources for self-regulation.

Safety: Spending time to ritualize the creation of a safe space/container for a gathering is equally important. This goes beyond the ice-breaking exercises that are routinely suggested in workshops. Ritualizing the practice and bringing a spiritual dimension to it allows people to more deeply connect to it, cultivate resources for resilience, and open up to deeper transformations.

Predictability: Rituals can support a minimum level of predictability (familiar roles and forms) so that novelty (which can refer to new ideas or processes as part of the transformation that peacebuilding entails) can be clearly contrasted and processed and change itself can feel less threatening. In other words, novelty can safely be attended to against a more predictable background. A significant part of the literature in neuroscience and neuropsychology addresses that element of novelty.⁸⁷ 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 rewarding, as it generally involves a release of dopamine in the basal ganglia (a set of connected brain regions that support reward processing), a neurochemical that is important for both reward processing and learning.

When we encounter a new situation, especially if it is rewarding or arousing in some way, neurons release dopamine. Generally speaking, in peacebuilding contexts, a sense of safety and familiarity needs to be built first, especially each time we operate in stressful situations. Once one feels in a safe environment, the human brain can explore.

Social bonding, interconnectedness, and trust building: Conditions of stress and threat reinforce and exacerbate ingroup/outgroup identities. Under stress, the body-mind focuses only on immediate survival needs and highlights us-vs.-them binaries as a means of self-preservation. Shared ritual experience that reduces levels of stress and facilitates (re)connection, beyond the boundaries of any particular identity group, may be a way to mitigate its isolating and polarizing effects.

Paying Attention to the Process of Engaging Local Rituals

In the way they approach rituals, and specifically spiritual rituals, peacebuilders (local but even more importantly international) are invited to go deeper into themselves and their own experiences, and to be invitational rather than invasive. As recent neuroscience research has mainly investigated Westernized appropriations (and standardization) of certain practices (such as meditation and yoga) and the results have been popularized in the media, the tendency of outsiders has often been to implement (although to limited extents) programs that export those same standardized practices, instead of looking at the equivalent in the local repertoires. It is understandable in view of the desire to design programs that can be “evidence-based” or that can be supported by some type of scientific approval. However, this is coming at a price. First, research has mostly come from the West in a biomedical framework that does not take into account cultural factors. Moreover, the normalizing of a vague Western misrepresentation of what these traditions embody, and the disconnect from the complex meaning systems that they are originally part of, as well as from the cultural contexts in which they are imported, can lead to the same technocratic biases that peacebuilding has already been suffering so much from. Ritualistic practices run the risk to be turned into standardized approaches, losing most of the characteristics that make them so powerful.

Peacebuilders should be mindful of this bias. Looking at local resources and applying a culturally embedded approach is an important aspect of the ethical guidelines developed by the Inter-Agency Standing Committee (IASC) for any support intervention that has a psychosocial component.⁸⁸ The recommendations are clear: the key to sustainable, community-based support is to build on existing resources, avoiding the imposition of

outside support that may undermine local resources and disappear as soon as the external funding has expired or the outsiders are gone (as is often the case with one-week or one-day workshops centered around, for instance, mindfulness practices or yoga). Syrian refugees in Turkey and Jordan have countless stories of this sort to share. Being mindful of these limitations is also part of the fundamental do no harm imperative.

Across the world, a constant complaint voiced by community actors is the feeling that they are not being heard or seen, and that their resources are never considered as valid. A lot of the conversation here echoes discussions on traditional justice mechanisms, including in their normativity, as outsiders have endlessly been debating if those practices were intrinsically “good” or “bad.” The approach suggested here is more pragmatic: neither glorifying the rituals as the only solution nor relegating them to the realm of the devilish,⁸⁹ but acknowledging their existence and asking which aspects can support the peacebuilding process. An important ethical consideration in that process is ensuring that the ritualized practices (or gestures) chosen, as well as the way in which they are incorporated, do not reinforce some power dynamics within a given society. For instance, in Sri Lanka, members of the Sarvodaya Movement has been criticized for the way they have been organizing interfaith gatherings centered on a specific spiritual practice (mostly Vipassana meditation) central to only one of the faiths—Buddhism.⁹⁰ They offer it in a nonsectarian and inclusive manner, but some have accused them of reinforcing Sinhala Buddhist majoritarianism in a context marked by power differences between different religious groups.⁹¹ Those same domination logics can also work across gender, generation, caste, and so forth. Being fully aware of these dynamics does not require years of study but an authentic dialogical exchange between insiders and outsiders, in each given context and for each specific purpose.⁹² This dialogue then becomes an opportunity for a true re-creation by the communities, providing them with skill-sets that they can extend more broadly. Rituals and ceremonies are often specific to a given locality and community, or may need to be in part adapted if not reinvented. Human beings have been doing it since the beginning of time. The role of peacebuilders is to support them in that process, not to do it in their place. The role of cultural brokers (or any individual who acts as intermediary between different epistemic communities) can be particularly crucial here. Outsiders need to be especially vigilant in that assessment and put in place processes that allow the identification of these resources and find ways to discuss them at the community level.

Part of that dialogue should be an education effort to share with the communities and their individual members some keys to understand what is happening in their brain

and how the ritualized practices that are part of their repertoires can potentially support them in building peace. Here again, some hybrid needs to be elaborated: a culturally adapted neuroscience that fits within their cultural models, as local communities may have different cultural concepts of mind/brain. That dialogue is, ultimately, part of what is also going to help the research expand and meet the needs on the ground.

Partnering with Neuroscientists to Develop Experimental Research

Moving forward, more partnerships should be developed between the peacebuilding and the scientific communities to develop well-designed experimental research that can provide a critical vantage point for evaluating mainstream knowledge, existing assumptions in the literature, and exposing fallacies. These research projects need to relate to real-life events and be developed in partnership with local communities and organizations, so that current hypotheses can be tested to considerably develop our understanding, in particular as far as collective dynamics and brain co-wiring are concerned. But for this to happen both neuroscientists and peacebuilders need an expanded understanding of each other's work.

Most of existing neuroscience research related to ritualized practices has relied on mainstream neuroimaging techniques that assess neural activity and function through proxy physiological measurements. These methods are also the best known to the public and what many have in mind when thinking of partnering with neuroscientists. Functional magnetic resonance imaging (fMRI) is one of the most widely known and is useful for mapping the approximate anatomical location of a cognitive process whereas electroencephalography (EEG) and magnetoencephalography (MEG) are very useful for measuring processes that occur on the order of milliseconds. Neuroimaging has a proven track record for developing detailed models of human brain organization and function. However, it presents many methodological limitations and, more importantly for the field of peacebuilding, strong constraints in the practicality of their use (e.g., in real-world field settings), beyond the most obvious issues of cost and availability. For peacebuilding organizations, the dream of the potential for showing the transformative impact of their interventions via brain images might be tempting, but it won't necessarily be the most informative or even useful, in particular when dealing with events as complex as ritualistic experiences.

Luckily, more portable, inexpensive, and at times more useful methods can be used in the field. For instance, transmission belts can be used to study the modulation of

breathing rate, heart rate, or blood pressure during ritual activity. Measurement of pupil dilation, skin conductance, blood pressure and heart rate can help assess arousal via the adrenergic system. The test of cortisol levels or the measurement of raw pulse data are all measurements that require low intervention and can help provide understanding of the experience of different stages of a ritual for different participants. Psychological tests (which can in part be administered as introspective self-reports), direct observations and peer reports can help confirm self-report data, and substantiate correlations. Biographical information and interviews with participants can provide essential insight on cultural perspectives and intrinsic intuitions that may not be readily detectable in a highly controlled experimental setting, such as a lab. Cross-cultural similarities and differences can be assessed via cultural formulation interview, which presents how each participant interprets experiences so the subsequent experiment can be tailored better to that interpretation and those goals. It is equally crucial to ensure participatory approaches in collecting practice-based evidence that has meaning in each cultural context concerned, making sure that the methods selected make sense and are not missing what is culturally relevant in that particular context.

Peacebuilders need to educate themselves on what neurobiological research looks like. It is far from happening only in a lab or involving “pretty pictures of the brain,” as our late colleague Jeremy Richman would often remind us. In fact, looking at the brain alone is not enough; an increasing number of scientists are walking away from the traditional internal view of the brain, abstracting it from the rest of the body and disconnecting it from the socio-cultural world. Cognitive and emotional processes can be better understood only if we consider human beings as whole embodied beings in their specific social and cultural environment⁹³ Fully understanding this complexity and spending time to elaborate sound questions for both fields will be important moving forward in order to more strongly advance our knowledge.

Conclusion

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, behaviors, and changes in the environment. This process needs to be understood within the framework of an embodied view of 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 (i.e., society, culture, nature). Ritualized practices are an important part of that system, affecting both the nervous system and the body. Peace itself also needs to be understood as an ecological process that is culturally and spiritually embedded, beyond the technicality of peacebuilding.

This article has argued that a better understanding of the potential and limits of rituals from a neurobiological perspective can help leverage existing peacebuilding resources present in every society. This approach does not suggest an alternative to the mainstream menu of peacebuilding, including the structural and institutional transformations that it involves. Rather, it offers an important complement by addressing some of the most intangible dimensions of the transition from violence to peace. Maybe more importantly, the intention is not to add to what communities may already do, but to leverage it, by trying to understand how their ritualistic experiences could be more fully engaged in the service of peace and how much of that engagement could make a difference, individually and collectively. This is where understanding how rituals can contribute to rewiring and cowering brains for peace becomes crucial for us all.

This article is dedicated to my dear friend and colleague Jeremy Richman, director of the Avielle Foundation and codirector of PeaceRewire, who left us as we were working on this article. His brilliance, extreme kindness, and passion for this work will forever be with us. This article is one of the many ways we are, with others, continuing his mission to prevent violence and create a more compassionate and peaceful world. With much gratitude to Dara G. Ghahremani and Matt Rossano for stepping in at the last minute in order to ensure the scientific quality of this article.

Notes

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Suggestions for Further Reading and Resources

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