

Attracted to Peace:

Introducing a Dual-Systems Model of the Dynamics of Sustaining Peace

Peter T. Coleman

The Morton Deutsch International Center for Cooperation and Conflict Resolution
Teachers College, Columbia University
The Advanced Consortium on Cooperation, Conflict, and Complexity
The Earth Institute at Columbia University

Joshua Fisher

The Advanced Consortium on Cooperation, Conflict, and Complexity
The Earth Institute at Columbia University

Douglas P. Fry

Department of Peace and Conflict
University of North Carolina at Greensboro

Larry S. Liebovitch

Department of Physics and Department of Psychology
Queens College, City University of New York
Physics Program, The Graduate Center, City University of New York

Allegra Chen-Carrel

The Advanced Consortium on Cooperation, Conflict, and Complexity
The Earth Institute at Columbia University

Philippe Vandebroek

shiftN, Belgium

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Abstract

Humans have a long history of studying war – and peacekeeping, peacemaking and peacebuilding in the context of war – which has left us with a rather nascent and distorted understanding of how societies sustain peace. This article builds on research on peaceful societies to offer a dual-systems model of the *dynamics of sustaining peace* – a particularly robust combination of violence-preventive and peace-promotive properties – conceptualizing its core variables and offering a set of propositions specifying their relations. The model approaches sustainable peace in terms of two mostly independent *attractor dynamics*, or emergent, multiply-determined patterns that resist change – one characterized by destructive intergroup interactions and one by more peaceful relations. Ultimately, the model offers both a qualitative platform for visualizing the dynamic relations between a complex array of variables relevant to sustaining peace, as well as a framework for mathematical modeling, empirical testing, measurement and policy making.

Keywords: sustaining peace, complexity science, dynamical systems, attractors

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It may come as a surprise to learn that there are many peaceful societies in existence today. In *War, Peace and Human Nature* (2015), anthropologist Douglas Fry presents findings from research on scores of internally and externally peaceful societies from around the world that directly refute the widely held and often self-fulfilling belief that humans are intrinsically warlike. Fry's research suggest that societies are much more likely to evolve in sustainably peaceful directions if they define themselves as peaceful and have developed a clearly specified sense of what this entails (Fry, 2006).

Yet since the early 90s and UN Secretary General Boutros-Ghali's proposed *Agenda for Peace*, the international community has been struggling to reorient the work of the UN beyond crisis management to prioritize sustaining peace. A 2015 report, authored by an advisory group of experts views this as a failure, writing, "(I)t is an overarching finding of this report that the key Charter task of sustaining peace remains critically under-recognized, under-prioritized and under-resourced globally and within the United Nations system" (United Nations, 2015, p. 11-12). The report goes on to state, "A change in mind-set is needed: rather than waiting until crisis breaks out and then making a default recourse to a crisis response, timely efforts to prevent conflict and then sustain peace need to be embedded across all sectors and phases of action."

Research should play a crucial role in specifying the conditions and processes that increase the likelihood of sustaining peace. Unfortunately, our understanding of peaceable societies is limited by the fact that most peace scholars do not study them (Coleman & Deutsch, 2012; Diehl, 2019; Goertz et al., 2016), and when peace is studied researchers tend to focus primarily on *negative peace*, or the absence of destructive conflict and violence, and neglect

positive peace, or the presence of more just, harmonious and prosocial social arrangements (Coleman, 2018a; Diehl, 2019; Goertz, et al., 2016). Furthermore, the scant research on peaceful societies tends to be approached through narrow disciplinary or sectorial lenses that often oversimplify how a complex set of interrelated variables affect each other over time (Coleman & Deutsch, 2012; Vallacher et al., 2013). The absence of a more comprehensive understanding impedes the design of effective policies, programs and measures for sustaining peace (Coleman, 2018a; Mahmoud & Makoond, 2017; United Nations, 2015).

In response, a multidisciplinary team of researchers have been employing ideas and methods from social and complexity science to conceptualize a dual-systems model of the *dynamics of sustaining peace* – a particularly robust combination of violence-preventive and peace-promotive community properties – which result in the formation of strong patterns of more constructive intergroup relations within and between communities and weaker patterns of more destructive relations. The aim of this project is to gain both a parsimonious *and* comprehensive understanding of the core dynamics and primary upstream parameters of sustaining peace. Building on the foundational work of others (Boulding, 1978; Christie et al., 2008; Coleman & Deutsch, 2012; Curle, 1971; Fry, 2006, 2012; 2015; Galtung, 1969; Goertz et al., 2016; Lederach, 1998; Reardon, 2012), and employing metaphors, models and methods from complexity science (Vallacher et al., 2011, 2013; Vandebroek et al., 2007), the current article presents a new model of the core dynamics of sustaining peace, specifying its main variables and offering a set of propositions characterizing their dynamic relations.

A Model of the Core Dynamics of Sustaining Peace

The approach to modeling in this project employs causal loop diagrams (CLDs) as tools for synthesizing science relevant to policy making with regard to complex societal challenges

(see Vandebroek et al., 2007). Following this approach, the steps to conceptualizing and modeling highly complex and dynamic societal phenomenon include specifying: 1) the *underlying assumptions and definitions of terms* of the model; 2) the *nodal focus* of the model, or the focal variables the model is meant to elucidate; 3) the *core dynamics* of the model, or a limited set of variables and relations that capture the essential dynamics of the phenomenon under study; and 4) building out the *broader components* of the model, or the variables found to influence the nodal variable indirectly through the core dynamics.

Underlying assumptions and definition of terms of the model

The current model is based on three primary assumptions. First, the model assumes that sustaining peace is possible under certain conditions, as evidenced by anthropological research on past and current internally and externally peaceful societies around the world (see Fry, 2006, 2012, 2015). Sustainably peaceful societies are operationalized for the purposes of this project as those societies that have remained highly internally and externally peaceful for a period of 50 years or more, as ranked by a variety of existing indices (i.e. Global Peace Index, Positive Peace Index, Corruption Perceptions Index, World Happiness Report, Freedom in the World Index, Social Hostilities Index, and the Multiculturalism Policy Index).

Second, the model assumes that *negative peace* (an absence of destructive conflict, violence and war), and *positive peace* (a prevalence of more just, inclusive, harmonious, and prosocial relations) are related but qualitatively different types of peacefulness – each with its own set of predictors, processes and outcomes (Coleman, 2012b; Galtung, 1969; Goertz et al., 2016). This means that the antecedents and conditions associated with stable states of negative peace are mostly distinct from those identified with enduring forms of positive peace.

Nevertheless, negative peace is believed to be a necessary but insufficient condition for positive

peace (Diehl, 2019). Accordingly, we define *sustainable peace*¹ as a particularly robust combination of both negative and positive peace dynamics, where positive peace builds on a foundation of negative peace, but includes additional dimensions and dynamics to constitute a more robust, complex and therefore sustainable form of peace (see Goertz et al., 2016).²

Third, the current model focuses on *the level of intergroup dynamics within and between communities*. This reflects a choice to focus at a level where societal peace and conflict dynamics often become structurally and normatively organized. In other words, although peaceful and nonpeaceful interactions happen within and between interpersonal relationships and families, more stable patterns of peaceful and conflictual communities typically organize around intergroup interactions (rival gangs, drug cartels, opposing political, ideological, religious, ethnic and nationalist groups, etc.). Here, *intergroup interactions* are defined as “any aspect of human interaction that involves individuals perceiving themselves to be members of a social category, or being perceived by others as belonging to a social category” (Taylor & Moghaddam, 1994, p. 6). We assume that the core dynamics at this level of analysis (intergroup) can be scaled up to represent the dynamics of communities both small and large, from villages to nations to the international community, with some modification.

Based on these assumptions, the current model defines more sustainable forms of peacefulness as involving *a set of complex dynamics that decreases the probabilities of using destructive conflict, coercion and violence to solve problems between groups to levels where it does not enter into any group’s strategy, and increases the probabilities of using cooperation,*

¹ *Structural violence* is a term commonly referring to a form of violence wherein some social structure or institution harms people by preventing them from meeting their basic needs (Johan Galtung, 1969, "Violence, Peace, and Peace Research"). In contrast, *structural peace* is defined as a form of peacefulness wherein social structures and institutions both prevent harm *and* promote positive relations.

² Some forms of international positive peace such as *warm peace* and *security communities* have been found to be ultimately more robust and therefore sustainable (see Goertz, Diehl, & Balas, 2016).

problem-solving and dialogue to promote social justice and well-being to levels where it governs social organization and behavior (see Boulding, 1978). Thus, the current conceptualization of *sustainable peace* combines previous views of negative peace and positive peace in a manner that recognizes their somewhat independent but complementary dynamics and contributions to peacefulness (Goertz et al., 2016).

Consistent with this view of the dynamics of sustainable peace, the current model is represented by two system's *attractors*: one for constructive and another for destructive intergroup dynamics, representing this set of two probabilities (see Figure 1). *Attractors* are defined as *a state or pattern of changes toward which a system evolves over time and to which it returns if perturbed* (Strogatz, 2003; Vallacher et al., 2010, 2013). Think of them like a gravity well, or a well-defined whirlpool in the flow of a river that draws in the currents around it. Attractors are determined by the relations between a variety of different variables at different levels of analysis, culminating in patterns in systems that attract or draw in the dynamics of the system and resist change. Ultimately, attractors are sustained by both the nature of the *elements* that constitute them as well as by the nature of the *dynamics* between them: the reinforcing and inhibiting feedback loops that connect the elements. *Reinforcing loops* occur where two or more elements influence one another dynamically along the same or similar trajectory as originally inclined, whereas *inhibiting loops* occur where two or more elements obstruct or constrain each other's initial flow. Particular configurations of these loops among elements result in *self-organizing dynamics*, which over time can create strong attractor patterns that resist change (i.e., intractable conflicts or sustainably peaceful societies; see Nowak et al., 2012).

Figure 1

Attractors for Destructive and Constructive Intergroup Relations

Attractors can differ in terms of their *valence* (such as constructive, destructive or neutral intergroup dynamics), their *strength* (or degree of attraction and resistance to change), and whether they are *manifest* (defining the current state of the system) or *latent* (representing a potential state; see Figure 1). Stronger attractors have a higher probability of attracting and maintaining the dynamics of a system (are relatively broader and deeper in Figure 1), while weaker attractors have a lower probability of capturing the dynamics for long (are narrower and shallower). Social systems with a history of relations between groups will tend to evidence more than one attractor, which can account for seemingly dramatic shifts in the nature of relations (such as from years of war to years of peace and back again; see Vallacher et al., 2010). As such, attractors are a particularly useful way to view the underlying dynamics of sustainably peaceful societies.

Accordingly, our technical definition of sustaining peace for the model is *a set of complex feedback dynamics that result in the emergence and maintenance of strong attractors for constructive interactions between groups (System 1) and weak attractors for destructive interactions (System 2; see Figure 2).*

Figure 2

A dual system model of attractors for sustainable peace

The nodal focus of the model

The primary focus of the current model of the dynamics of sustaining peace is on the basic human dynamic of reciprocity, a process seen as fundamental to both positive (Dovidio & Banfield, 2015; Eisenberg et al., 2010; Fry, 2015) and negative (Eisenberger et al., 2004; Kteily

et al., 2016; Pruitt & Kim, 2004) intergroup relations. *Reciprocity* is often defined as a social rule that requires people to repay, in kind, what another person has done or given them, whether of a positive or negative nature (Cialdini, 2007). In behavioral terms reciprocity describes the tit-for-tat interaction dynamic between two entities (see Segal & Sobel, 2007).

Fry (2015) views *positive reciprocity* as a central component of peaceful societies. He writes:

In my view, peace is not just an absence of war, but also people getting along pro-socially with each other: the cooperation, sharing and kindness that we see in every day society. Peace is positive reciprocity: I show you a kindness and you do me a favor in return, multiplied throughout the social world a million times over (Fry, 2015: 544).

Positive Intergroup Reciprocity (PIR) is therefore defined as an interaction that occurs when an action committed by a member of one group (A) that has a positive effect on a member of another group (B) is returned by a member of B to a member of the original group (A) with an action that has an approximately equal or more positive effect (see Caliendo et al., 2012).

Considerable research supports the idea that positive intergroup reciprocity increases outgroup empathy, cooperation, and other prosocial behaviors (see Dovidio & Banfield, 2015; Eisenberg et al., 2010; Fisher, 2014 for summaries). It has also shown that positive intergroup interactions can stimulate a reinforcing feedback loop where they self-perpetuate and take on a life of their own. Deutsch (1973) found across multiple studies that cooperative interactions tended to increase the conditions conducive to future cooperation, thus creating a self-

perpetuating spiral of cooperation, a dynamic he labeled *The Crude Law of Social Relations*.

Similarly, Doosje & Haslam (2005) found that groups acted more favorably to other groups who

had previously acted favorably to them so that a ‘basic reciprocal pattern’ emerged. When these reinforcing dynamics are strong, positive intergroup attractors are more likely to form.

In contrast, scholars have identified *negative reciprocity*, or a willingness to harm those who previously harmed you (Caliendo et al., 2012), as the essence of destructive escalatory processes in conflict (see Pruitt & Kim, 2004). Escalatory spirals are when “Party’s contentious tactics encourage a contentious retaliatory or defensive reaction from Other, which provokes further contentious behavior from Party, completing the circle and starting it on its next iteration” (Pruitt & Kim, 2004: 96). Thus, *Negative Intergroup Reciprocity* (NIR) is defined as occurring when an action by a member of one group (A) that has a negative effect on a member of another group (B) is returned by a member of B with an action that has an approximately equal negative or more adverse effects on a member of the first group (Caliendo et al., 2012). NIR may also result when there is an asymmetrical or exploitative relationship, such as when a positive action by a member of group A is not met with a sufficiently positive action by group B (or is met with a negative action, thus violating the rule of reciprocity; Gouldner, 1960; Sahlins, 1972).

Research has found that when treated unfavorably, those who endorse a negative reciprocity norm are more likely to respond with anger and revenge (Eisenberger et al., 2004). This is particularly so in the context of *honor cultures*, where negative reciprocity in the form of retribution for harm is seen as a duty and obligation (Nisbett & Cohen, 1996). In the context of negotiation, Brett et al. (1998) found that the frequency of reciprocating ‘contentious communications’ between parties was more likely to result in distributive outcomes where one party was harmed. Across a range of studies, Kteily et al. (2016) found that when an ingroup suspects that they are being dehumanized by an outgroup, they will respond to the outgroup with

more hostile and aggressive behaviors and attitudes through reciprocated dehumanization. Under certain conditions, these reinforcing feedback dynamics will evidence destructive, self-perpetuating patterns as well (see Deutsch, 1973; Pruitt & Kim, 2004).

Although positive and negative intergroup reciprocity appear to be mirror images of one another, their relative effects are not symmetrical. Decades of research has supported a considerable *negativity effect*, or the finding that, even when of equal intensity, experiences of a more negative nature (thoughts, emotions, actions, events) have a greater and more long-lasting effect on one's psychological state and social processes than do neutral or positive elements (Baumeister et al., 2001; Kanouse & Hanson, 1971; Lewicka et al., 1992; Rozin & Royzman, 2001). For instance, negative information is processed more thoroughly, and negative impressions and stereotypes are more resistant to disconfirmation than positive ones (Baumeister et al., 2001). Relatedly, research on prejudice formation has found that negative intergroup contact predicts increased prejudice toward outgroups more than positive contact lessens it (Barlow et al., 2012).

It is also important to emphasize that positive and negative experiences of intergroup interactions are not bipolar, but are rather bivariate, and can exist simultaneously and function somewhat independently of one another (Clark & Watson, 1991; Larsen et al., 2001; Watson & Clark, 1992; Watson & Tellegen, 1985). For instance, research has shown that while both positive and negative reciprocal behavior are common, “positive and negative reciprocity turn out to be only weakly correlated for individuals, which suggests that these are distinct traits rather than two sides of the same coin” (Dohmen et al., 2008: 85).

Accordingly, several areas of research on the dynamics of positivity and negativity in social relations has emphasized the *ratio* of positivity-to-negativity in predicting stability and

functionality in social relations (Carrère et al., 2000; Fredrickson & Losada, 2005; Gottman, 1993; Gottman et al., 2002; Lewis, 2005). Positive and negative experiences have been found to build up incrementally over time in social relations (with some degree of dissipation), affecting how subsequent encounters are experienced and interpreted (Gottman, 1993; Gottman et al., 2002). Conflict in these relationships can be informative and constructive, but only when there is a sufficient reservoir of positivity (trust, rapport, respect, etc.) built up to mitigate the strong pull of the negativity effects of conflict (Gottman et al., 2014).

Building on these findings, we define the nodal focus of our model of sustaining structural peace as *the ratio of Positive Intergroup Reciprocity (PIR) to Negative Intergroup Reciprocity (NIR)*. In other words, we propose that the central dynamic responsible for the emergence of sustainably peaceful relations in communities is the thousands or millions of reciprocal intergroup interactions that occur between members of different groups in those communities daily, and the degree to which more positive interactions outweigh more negative.

These interactions can be minor, such as modest gestures of intergroup kindness or microaggressions against outgroups (Sue et al., 2007), or major, such as heroic deeds of protection or hate crimes targeting outgroups, which will affect their relative impact.

Accordingly, we propose that in general the higher the frequency and strength of PIR to NIR the higher the likelihood of sustaining structural peace.

Proposition 1: Higher ratios (frequency and strength) of Positive Intergroup Reciprocity to Negative Intergroup Reciprocity will lead to higher probabilities of sustaining peace.

In other words, the stronger the dynamic of Positive Intergroup Reciprocity in a community, the more robust the (emergent) attractor dynamic for peaceful intergroup relations will be, thus

increasing the chances of sustaining peace, but only when complemented by relatively weak dynamics of Negative Intergroup Reciprocity, which result in more fragile or nonexistent attractor dynamics for destructive intergroup relations (see Figure 3). Together these parallel dynamics constitute the essence of sustainable peace.

Figure 3

The nodal focus of the CLD of sustainable peace

The effects of intergroup power differences on PIR and NIR

Power can be conceptualized and operationalized in many ways, but here it is viewed in terms of its impact on the nodal focus of the model. Research suggests that the impact of differences in relative power (authority, status, strength, resources, etc.) between groups typically results in *a magnifying effect of both PIR and NIR on members of lower power groups and a minimizing effect of both types of reciprocity on members of higher power groups*. For instance, Keltner, Gruenfeld & Anderson (2003) found that being in a position of higher power had a disinhibiting effect on social behavior, thus making powerholders less susceptible to pressure from social rules like reciprocity, whereas individuals with less power felt more socially constrained and thus inclined to follow such rules more carefully. Fiske (1993) found that those in lower power also tend to *attend* more to powerholders – as a means of enhancing their prediction and control of them – while those in higher power attend less to low power others. These differences can also account for differences in the awareness and impact of both PIR and NIR, as those in low power may simply attend to and thus perceive more incidents of both than those in high power.

Proposition 2: Differences in relative power between members of two groups will result in a magnifying effect of both PIR and NIR on members of lower power groups and a minimizing effect of both types of reciprocity on members of higher power groups.

In addition, Deutsch (2006) found that members of high and low power groups differed in the degree to which they feel constrained or unconstrained about initiating behavioral interactions with members of the other group. The relative privilege of the powerful often imbues them with a sense of the normative right to initiate behaviors of a positive or negative nature with those in lower power, while those in lower power typically feel more constrained about initiating such actions, particularly those of a negative nature. Keltner et al. (2003) characterize this as the difference between an *approach* orientation to one's goals and awards that the powerful are more likely to exhibit, versus an *avoidance* orientation, which is more prevalent among those with less power.

Proposition 3: Differences in the relative power between two groups will result in a higher likelihood of NIR being initiated by members of higher power groups and a lower likelihood of NIR being initiated by members of lower power groups.

The power effects outlined in Proposition 2 and 3 will both be influenced by the *magnitude* of the power differences between the groups, with more extreme differences in power, status and authority leading to more magnification effects and avoidance tendencies in lower power groups and more minimization effects and approach tendencies for those in higher power (Zartman & Rubin, 2002).

The core dynamics of the model

Building out from the nodal focus of our model, the *core dynamics* represent a limited set of feedback loops that capture the essential dynamics most directly relevant to the ratio of PIR to NIR in communities. Our model proposes three sets of core dynamics: 1) *Current Intergroup Norms and Structures* (institutions, structures and processes) operating in the present context to promote, prevent, or mitigate PIR and NIR, which, in turn, affect the strength of these same norms; 2) *Future Intergroup Goals and Expectations* (goals, objectives, plans, visions, agreements, etc.) around future intergroup encounters that promote, prevent, or mitigate PIR and NIR, which, in turn, affect the strength of these same expectations; and 3) *Past Intergroup Historical Accounts* (formal and informal accounts, symbols, memories, ceremonies, documents, etc.) of past events that promote, prevent, or mitigate PIR and NIR, which, in turn, affect the salience, strength and accessibility of these same histories.

The Dynamics of Current Intergroup Norms and Structures

Every community establishes standards, principles, rules and norms of good and bad intergroup behavior, which over time become infused into the institutions (marriage, family, education, work, governance, etc.), structures (language, incentives, rewards, opportunity, design, policies, laws, etc.), and formal and informal processes (communications, grievance procedures, information sharing, punishment, etc.) that, in turn, shape the community ethos on intergroup relations (Tajfel et al., 1971; Posner & Rasmusen, 1999). These rules and norms allow or encourage some reciprocal actions between members of some groups, and prohibit or discourage others. In time, these normative pressures can become internalized through socialization and reinforcement and lead to automatic behavior – unconscious or uncontrolled compliance with situational demands (Chong, 1994).

Current Norms and Structures promoting Positive Intergroup Reciprocity, which, in turn, increases the strength of positive norms. In a study of over 100 peaceful societies, Fry (2006; 2012) identified a set of basic institutions, structures, and processes that tend to foster positive intergroup relations across these societies. They include: *crosscutting structures* (LeVine & Campbell, 1972; Varshney, 2002), or group arrangements like mixed-ethnic kinship, political and sports groups that provide connections to different identity groups which pull loyalties in more than one direction; *cooperative interdependence* (Deutsch, 1973, 2014; Johnson & Johnson, 2011), where mutually beneficial task, goal and reward structures promote more constructive forms of intergroup behavior (Dovidio & Banfield, 2015; Deutsch, 1973; Johnson & Johnson, 2005); *socialization of peaceful values and attitudes* (Baszarkiewicz & Fry, 2009; Souillac & Fry, 2014), where children and other newcomers to a community are indoctrinated with tolerant, nonviolent, self-transcendent values and attitudes; *integrative methods of governance* (Ansell & Gash, 2007; Pinson, 2002), or forms of governance that seek to create unity through inclusive and collaborative participation of all its citizens; *overarching social identities* (Barth et al., 2015; Deutsch et al., 2012), when societies choose to ‘expand the us’ by emphasizing unifying superordinate identities to include members of outgroups into their sense of community; *ceremonies and symbols celebrating peace* (Maiese, 2007; Schirch, 2005), including commemorations of peaceful individuals, actions or events as well as rituals that reaffirm peacefulness; *shared visions of peace* (Bonta, 1996; Broome, 2004; Fry, 2012), when groups specify and share a worldview where destructive intergroup conflict is resolved in ways that maintain peace; and *peaceful leaders and elite*: (Nyden et al., 1997; Spreitzer, 2007), when prominent leaders model and commit to peace and nonviolence and inspire and motivate others to do the same. Each of these factors contributes differing degrees of normative pressure to

behave positively and respond reciprocally to positive gestures from members of outgroups, thus increasing the propensity of PIR in communities (see Figure 4). Additionally, scholars have noted the reinforcing effects of peace in communities, where peacefulness in turn leads to more positive intergroup attitudes, beliefs, behaviors, and norms (Fischer, 2007).

Figure 4

CLD of the core dynamics of sustainable peace

Proposition 4: Institutions, structures and processes that promote positive intergroup relations will lead to higher levels of normative pressure for PIR resulting in an increase in Positive Intergroup Reciprocity.

Proposition 4a: Higher levels of Positive Intergroup Reciprocity will increase the strength of institutions, structures and processes that promote positive intergroup relations.

Propositions 4 and 4a constitute the first *virtuous cycle* of our model, a reinforcing feedback loop between positive intergroup norms and structures and PIR that can result in increasingly strong positive intergroup dynamics.

Current Norms and Structures promoting Negative Intergroup Reciprocity, which, in turn, affect the strength of these same norms. Research on intergroup conflict has also identified a set of basic institutions, structures and processes that foster more negative intergroup relations in communities (see Brewer, 2007; Dovidio & Banfield, 2015; Fisher, 2014; Fry, 2015). These include: *pyramidal-segmentary group structures* (LeVine & Campbell, 1972; Varshney, 2002), or community arrangements where members of smaller groups are nested within and exclusive to larger identity groups, such as when Protestants and Catholics in Northern Ireland only work, pray, play and send their kids to school with members of their own religion; *extreme and untempered forms of competitive interdependence* (Deutsch, 1973; Johnson & Johnson,

2005), when competition between groups occurs in a context devoid of norms and rules for mutual cooperation; *socialization of hostile values and attitudes*, when new members of groups are taught self-enhancement values, outgroup intolerance and contempt, and normalization of violence (Fry & Miklikowska, 2012; Knafo et al., 2008); *divisive methods of governance* (Belkin, 2005; Staub, 2001), when leaders employ divisive strategies to foster tensions between groups as a way of holding onto power; *zero-sum identity groups* (Coleman & Lowe, 2007; Fordham & Ogbu 1986; Kelman, 1999), when groups define themselves through negation and disparagement of out-groups; *institutionalized forms of distributive and procedural injustice*, when ingroup bias and outgroup discrimination become infused into the ‘fairness-making’ and ‘conflict-resolving’ structures (Rapoport, 1974; Smyth, 2002); and *inequitable opportunity structures and access to resources* (Gurr, 2000; Sidanius & Pratto, 2001), which grant more powerful groups unequal access to positions of leadership, jobs, decent housing, education, and the like. Each of these factors can contribute normative intergroup pressure to behave negatively and respond reciprocally to negative gestures from members of outgroups, thus increasing the propensity of NIR in the community (see Figure 4).

Proposition 5: Institutions, structures and processes that promote negative intergroup relations will lead to higher levels of normative pressure for NIR resulting in an increase in Negative Intergroup Reciprocity.

Proposition 5a: Higher levels of Negative Intergroup Reciprocity will increase the strength of institutions, structures and processes that promote negative intergroup relations.

Hypotheses 5 and 5a constitute the first *vicious cycle* of our model, a reinforcing feedback loop between negative norms and structures and NIR that can result in escalating destructive intergroup dynamics and more robust negative attractors.

Current Norms and Structures preventing or mitigating Negative Intergroup Reciprocity, which, in turn, affect the strength of these same norms. Research has also identified a specific set of structures and processes that can prevent or mitigate negative intergroup relations in peaceful societies. These include: *effective intergroup conflict management mechanisms* (see Coleman, 2012a; Fry, 2006; Goertz et al., 2016) that help to resolve disputes constructively when they do emerge; *safety and security through the rule of law* (Crocker et al., 1996; Jaruma, 2013), when rule of law provides a sufficient level of sanctuary for members of all groups, in particular women (Hudson, 2012); *effective, accountable and transparent institutions* (Schedler, 1999), that meet the basic needs of members of all groups; *social taboos against violence* (Fry, 2006), which prohibit the use of violence in homes, schools, workplaces, and public spaces; *free flow of information* (Choi & James, 2006; Siegle et al., 2004), where access and openness of information are prevalent; *basic need satisfaction*: (Bangura, 2016; Feyzabadi et al., 2015; Laplante, 2008), when basic access to food, water, shelter and human dignity is sufficient; *sustainable development* (Aburdeineh et al., 2010; Annan, 2004; Oluduro & Oluduro, 2012), when development meets the needs of current and future generations without degradation to the Earth, and *norms regulating territorial acquisition and minority succession* (Goertz et al., 2016), which serve to discourage coercive forms of land acquisition and threats to sovereignty and security between groups, communities and nations.

Proposition 6: Institutions, structures and processes that mitigate intergroup competition, polarization, enmity and coercion will lead to lower levels of NIR.

Each of these factors can serve to lessen the normative pressure to instigate or reciprocate NIR.

The Dynamics of Future Intergroup Goals and Expectations

In addition to current norms, all groups are purposeful to some degree and set their sights on future states that they wish to approach or avoid. These may manifest in the hopes, dreams and fears of a few elite members, or in formalized goals, plans, agreements, contracts and treaties representing a plurality of interests. These visions and plans introduce an anticipatory form of pressure into the community through the more distal motives and expectations they are associated with. However, plans, agreements and expectations can also be violated, leading to a rupture in trust or the establishment of distrust with regard to the violating parties (see Lewicki & Bunker, 1995). These dynamics all directly affect pressures for PIR and NIR.

Future Goals and Expectations of constructive intergroup encounters promote Positive Intergroup Reciprocity, which, in turn, increase the strength of positive expectations. According to the research informing the Crude Law of Social Relations (Deutsch, 1973), positive intergroup reciprocity can lead to the creation of confident positive expectations (i.e., trust) and goals for future interactions with members of the same group, which in turn lead to increased positive reciprocity. The connections between these variables are displayed in Figure 4.

Proposition 7: Positive Intergroup Reciprocity will lead to higher levels of positive goals and expectations for future interactions with members of the same group.

Proposition 7a: Positive intergroup goals and expectations for future interactions with members of a group will lead to higher levels of Positive Intergroup Reciprocity with members of the same group.

This is the second *virtuous cycle* of the model. A number of studies support Proposition 7. For instance, friendships between Protestants and Catholics in Ireland have been shown to increase levels of *intergroup trust* (Paolini et al., 2007; Kenworthy et al., 2016), defined as *confident positive expectations of others in situations entailing risk* (see also Deutsch, 1973). Similarly, a survey in South Africa found that individuals with cross-group friendships indicated that they trusted the outgroup more (see Turner et al., 2010).

Studies also support Proposition 7a. A survey of Protestant and Catholic young adults in Northern Ireland found that individuals who had more trust for the outgroup had inclinations to behave more positively and less negatively toward them (Turner et al., 2010). Turner et al. (2013) found that imagining contact with an outgroup increased trust in them and lowered intergroup anxiety, which lessened the tendency to avoid the group. Another study surveying 400 Israeli Jews found that trust was significantly and positively associated with peace vision endorsement, an expressed willingness to make concessions to end the conflict (Noor et al., 2015).

***Future Goals and Expectations* around destructive intergroup encounters promote Negative Intergroup Reciprocity, which, in turn, increases the strength of negative expectations.** According to the Crude Law of Social Relations (Deutsch, 1973), negative intergroup reciprocity will also lead to the creation of confident negative goals and expectations (i.e., distrust) for future interactions with members of the same group, which in turn lead to increased negative intergroup reciprocity (see Figure 4).

Proposition 8: Negative Intergroup Reciprocity will lead to higher levels of negative goals and expectations for future interactions with members of the same group.

Proposition 8a: Negative intergroup goals and expectations for future interactions with members of a group will lead to higher levels of Negative Intergroup Reciprocity with members of the same group.

Hypotheses 8 and 8a represent our second *vicious cycle*. Negative contact can contribute to increases in perceived threat between groups (Riek et al., 2006), which can increase a sense of intolerance of the outgroup (Gibson, 2011). Bombay et al. (2013) found that perceptions of current discrimination by members of minority groups were related to less trust in the majority. Harth & Regner (2017) observed a ‘spiral of distrust’ in their study using a trust game, where individuals who endorsed negative reciprocity norms and received a lower bank transfer from their partner in the game, reported higher anger levels and expressed less willingness to cooperate – an effect that increased throughout the game. Nadler & Liviatan (2006) found that when Israeli Jewish participants held low levels of trust for Palestinians, their willingness to reconcile actually *decreased* after exposure to expressions of empathy from Palestinians.

The Dynamics of Past Intergroup Historical Accounts

Clearly, subjective experiences, sentiments and memories from the past shape and inform present interactions with others (Oren et al., 2015; Sargent & Bartoli, 2015), as do more objective artifacts, documents and acts of commemoration. Decades of research have shown that previously established attitudes that are stable and accessible predict current behavior (Glasman & Albarracín, 2006), as do longer-term sentiments (Halperin & Gross, 2011). Research has also shown that people tend to seek out information that confirms existing conceptions of the self and others, whether positive or negative (see Hixon & Swann, 1993; Swann et al., 1990). When historical accounts of intergroup relations become shared collectively, they can exert additional pressure to conform (Bar-Tal, 2013). When these accounts become formalized through official

documents, history textbooks, or ceremonies, they become even more influential in shaping current realities by establishing the “facts” of the past (Nets-Zehngut, 2008, 2012). Together, these influences from the past shape and drive the actions of the day, which then often become incorporated into the historical accounts of tomorrow.

Past Historical Accounts of constructive intergroup encounters promote Positive Intergroup Reciprocity, which, in turn, increases the salience, strength and accessibility of positive historical accounts. A review of intergroup literature notes how positive interactions and attitudes established in the past can foster continued positivity toward the outgroup even when a number of years separate the initial interaction from the present (Siem et al., 2016; see Figure 4).

Proposition 9: Stronger, more accessible Positive Intergroup Historical Accounts will lead to higher levels of Positive Intergroup Reciprocity.

Proposition 9a: Higher levels of Positive Intergroup Reciprocity will lead to stronger, more accessible Positive Intergroup Historical Accounts.

Proposition 9 and 9a constitute our third *virtuous cycle*. There is research on the mutual reinforcement of past and present positive interactions, although such effects are relatively understudied. As identified by Deutsch (1973), cooperative experiences in the past will tend to elicit similarly positive processes and expectations in the present, which can be self-perpetuating into the future. There is also strong evidence that early socialization of inclusive values of tolerance for outgroups leads to more cooperative behaviors (Fry & Miklikowska, 2012; Sandy & Boardman, 2001) and the inhibition of stereotyping (Devine, 1989).

In South Africa, the Truth and Reconciliation Commission (TRC) was formed after Apartheid based on the assumption that national unity and stability could only be achieved through creating a shared historical narrative through a systematic exploration of the ‘truth’ of what occurred during apartheid (Gibson, 2004). In an interview study, Gibson (2004) found evidence of a causal relationship between acceptance of the shared truth narrative and reconciled interracial attitudes among White, Asian, and Coloured South Africans. However, it is important to note that Black South Africans demonstrated more negative interracial attitudes and no connection between acceptance of a truth narrative and changes in interracial attitudes.

Past History of unresolved destructive intergroup encounters promote Negative Intergroup Reciprocity, which, in turn, increases the salience and strength of negative historical accounts. Higher levels of Negative Intergroup History, when denied, unaddressed or unresolved, will lead to higher incidents of NIR, which in turn will lead to more salient, robust and accessible accounts of negative intergroup history, creating a third *vicious cycle* (see Figure 4).

Proposition 10: Stronger, more accessible Negative Intergroup Historical Accounts that remain unresolved will lead to higher incidents of Negative Intergroup Reciprocity.

Proposition 10a: Higher levels of Negative Intergroup Reciprocity will lead to stronger, more accessible Negative Intergroup Historical Accounts.

In a study of members of Palestinian and Israeli Diasporas, Coleman & Lowe (2007) found that a stronger sense of negative intergroup history drove the formation of oppositional group identities, which fostered greater in-group dysphoric rumination and out-group hostility. When historical intergroup negativity affects socialization across generations (Kelman, 1999;

Toscano, 1998), it serves as the basis for greater NIR in the present and future. Research by Gottman et al. (2002; 2014) suggests that such negativity accumulates in relationships and therefore sets a lower threshold for future negative conflicts, which establishes the conditions for greater NIR. A study of Jewish and Polish students found that intergroup interactions involving conversations over history led to less intergroup liking and stronger perceptions of anti-Semitism (Bilewicz, 2007). Destructive narratives that inform collective historical memories have been found to greatly contribute to protracted conflict between groups (Oren et al., 2015).

In relation to Proposition 10a, higher levels of NIR have been found to increase the salience of in-group/out-group identities (Fischer, Haslam & Smith, 2010), and to fuel both implicit biases and overt hostilities (Brewer, 2007; Fisher, 2012, 2014). Therefore, it stands to reason that greater NIR in the present would perpetuate a vicious cycle of negativity that drives selective perceptions of bias-confirming information (Canosa, 2009) and creates an increase in self-fulfilling prophecies (Merton, 1948)—both of which entrench a negative sense of history and motivates individuals to process future perceptions through the lens of negative past experiences.

To summarize, Propositions 4-10a characterize how the three core dynamics (current norms and structures, future goals and expectations, and past historical accounts) of the peace model mutually influence and are influenced by PIR and NIR. These three sets of dynamics all serve to increase or decrease the likelihood of PIR and NIR, affecting their incidence, the strength of their associated positive and negative attractor dynamics, and their concomitant probabilities for sustainable peace.

Building the model out further, we have specified the relationships between each of the variables in the core engine to one another. These connections and how the variables may

reinforce or inhibit one another also have bearing on the nodal focus and therefore on probabilities for sustainable peace (see Figure 4). These connections are characterized in Propositions 11 to 16a (see Table 1).³

Table 1

Additional propositions 11-16a for the full core engine

Together, the nodal focus and core dynamics of the model present the central processes affecting the emergence, strength and sustainability of constructive and destructive intergroup attractor dynamics within and between communities (see Figure 4). The more robust effects of negatively valent variables are assumed to have a compounding effect on one another and on the relative strength and duration of more destructive attractors for intergroup relations. This highlights the central importance in communities of increasing those conditions and factors that *both* obstruct or mitigate against these reinforcing relations (effective conflict management mechanisms, rule of law, taboos against violence, etc.), as well as those that promote stronger and more durable positive attractors (cooperative interdependence, shared identities, visions for peace, etc.). In other words, of promoting sustainable peace.

Further Development of the Model

This paper presents a basic theoretical model of the core dynamics of sustaining peace based on evidence gleaned from the study of sustainably peaceful societies and constructive intergroup relations, and offers a set of testable propositions for its further development. The core model is but one component of an ambitious project aimed at ultimately providing an

³ Space limitations do not allow for a full summary of the empirical literature supporting Propositions 11-16a. See <http://ac4.ei.columbia.edu/research-themes/dst/sustainable-peace/> for more information.

evidence-based roadmap for sustaining peace that is both comprehensive (the full causal loop diagram) and parsimonious (the model presented here).

Subsequent steps for the development of the model are include:

- 1) **Further specification and validation the relationships between each of the variables in the core engine to one another.** To date, an extensive database has been compiled of hundreds of studies from dozens of disciplines supporting the propositions of the core model, which has been made available to the public through a website ([hyperlink removed for masked review](#)) featuring a visualization of the full causal loop diagram of the science on sustaining peace.
- 2) **Estimation of the weights of the relations between the variables in the core engine through standardization of effect sizes generated from different approaches to published research.** A meta-analysis has been conducted of the studies supporting the main effects of each individual link in the core engine (Propositions 1-10a), and estimates have been generated of their relative weights.
- 3) **Further validation of current propositions through comparative analysis of existing ethnographies of peace systems and non-peaceful systems.** *Peace Systems* are clusters of neighboring societies that do not make war with each other. We are currently coding and analyzing 15 ethnographic and historical/political examples of peace systems as contrasted with a comparison sample of 30 other societies and their neighbors, to further verify and refine our understanding of the core dynamics of the model (authors, working paper).
- 4) **Development and testing of the systemic properties of the model by employing a mathematical version based on the core engine.** A mathematical model of the core dynamics of sustaining peace has been developed and is being tested and refined through the

use of data science techniques, such as scraping to social media data, machine learning and topic modeling (authors). To date, findings from simulations of the model have supported the dual-systems attractor dynamics of the model. A Graphic User Interface of the model is currently available [here](#).

- 5) **Building out the next levels of the CLD by specifying and validating the dynamic relations between secondary variables.** We have currently identified 73 distinct variables with 186 connections at the individual, community, and macro levels that have been found through research to be associated with either promoting PIR and peace or mitigating NIR and destructive intergroup conflict. These variables are being mapped onto the CLD, and have resulted in a current total of 231 propositions.
- 6) **Ground-truthing of the model with stakeholders from peaceful societies.** We are currently engaging in a study of four sustainably peaceful nations (Mauritius, Costa Rica, New Zealand, and Norway) *with* local members of each society, which includes desk research, local focus groups and interviews, and national surveys. Through ground-truthing, a participatory research process that invites community members and local experts to share and construct context specific conceptions and measures relevant to sustaining peace, this project intends to further understanding of the dynamic factors and processes that contribute to sustaining positive peace (see authors).
- 7) **Translation of the preliminary findings from research on the model for policy makers interested in sustaining peace.** A principle aim of our project is to support policy makers in better understanding the policies, programs and measures to achieve this transition more effectively. Accordingly, we have been working with UN representatives through the *International Peace Institute* to offer a series of presentations and policy papers on the

science of sustaining peace (authors). The project will culminate in the launching of an interactive computer website that will allow for local customization and testing of decisions, policies and programs for sustaining peace.

- 8) **Development of new metrics and methods for measuring patterns and trends in communities relevant to sustaining peace.** There are currently few indices that measure peaceful societies, and those that do often focus heavily on negative peace and economic factors and fail to consider the idiosyncratic and context-specific natures of peace (Coleman, 2018; Coleman & Mazzaro, 2013; Diehl, 2019). Currently, we are developing new measures and methods to track probabilities for sustaining peace, and are considering how best local elicitive methods can inform more macro measures of peacefulness. Both bottom-up elicitive methods and top-down theoretically-informed surveys of the core variables are being developed in order to populate a multi-dimensional index for tracking peacefulness.

Conclusion

Of course, it is absurd to believe that all peaceful societies are the same – their differences are clearly manifold. However, perhaps at their core, sustainably peaceful societies can be understood and modeled as a set of fundamental human dynamics, which are in turn affected by the hundreds or thousands of conditions, processes and interactions that are most evident in these differences. The discovery, articulation and validation of such core dynamics, and their nonlinear relations with the multitude of different factors that make up our diverse societies, may allow us the means through which to better comprehend and prioritize our diverse efforts towards sustaining positive peace.

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Proposition 11: Higher levels of Positive Past Historical Accounts will lead to higher levels of Positive Future Goals and Expectations.

Proposition 12: Higher levels of Negative Past Historical Accounts will lead to higher levels of Negative Future Goals and Expectations.

Proposition 13: Positive Past Historical Accounts will lead to increased strength of Positive Current Norms and Structures.

Proposition 13a: Positive Current Norms and Structures will lead to stronger Positive Past Historical Accounts.

Proposition 14: Negative Past Historical Accounts will lead to increased strength of Negative Current Norms and Structures.

Proposition 14a: Negative Current Norms and Structures will lead to stronger Negative Past Historical Accounts.

Proposition 15: Positive Current Norms and Structures will lead to higher levels of Positive Future Expectations.

Proposition 15a: Higher levels of Positive Future Expectations will lead to stronger Positive Current Norms and Structures.

Proposition 16: Negative Current Norms and Structures will lead to higher levels of Negative Future Goals and Expectations.

Proposition 16a: Higher levels of Negative Future Goals and Expectations will lead to stronger Negative Current Norms and Structures.

Table 1: Additional propositions 11-16a for the full core engine

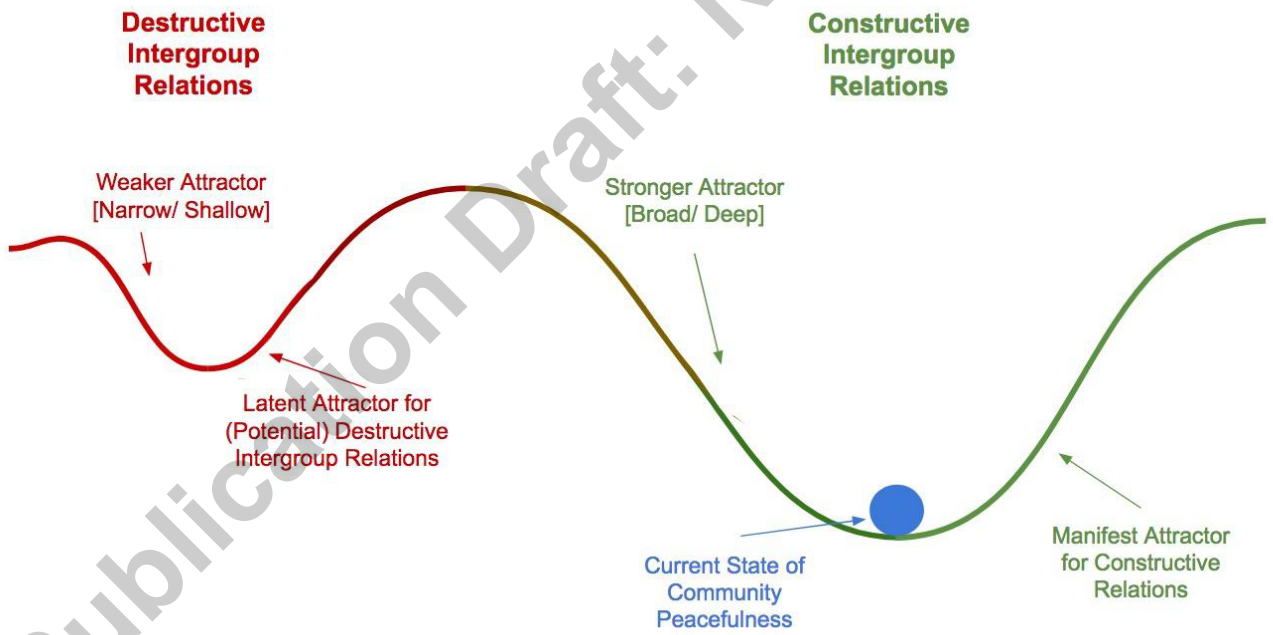


Figure 1: Attractors for Destructive and Constructive Intergroup Relations

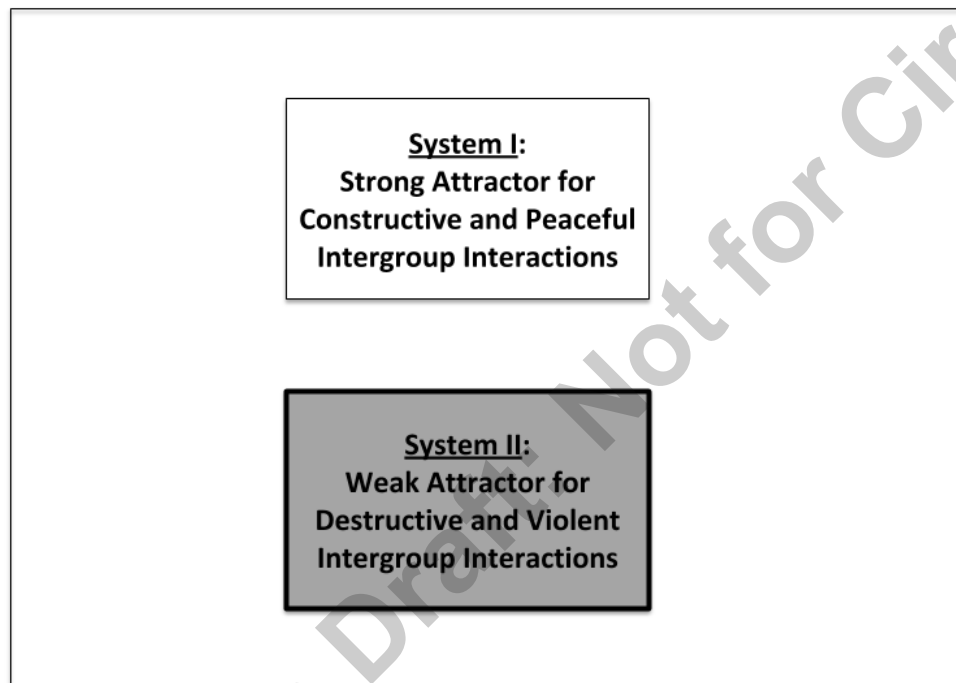


Figure 2: A dual system model of attractors for sustainable peace

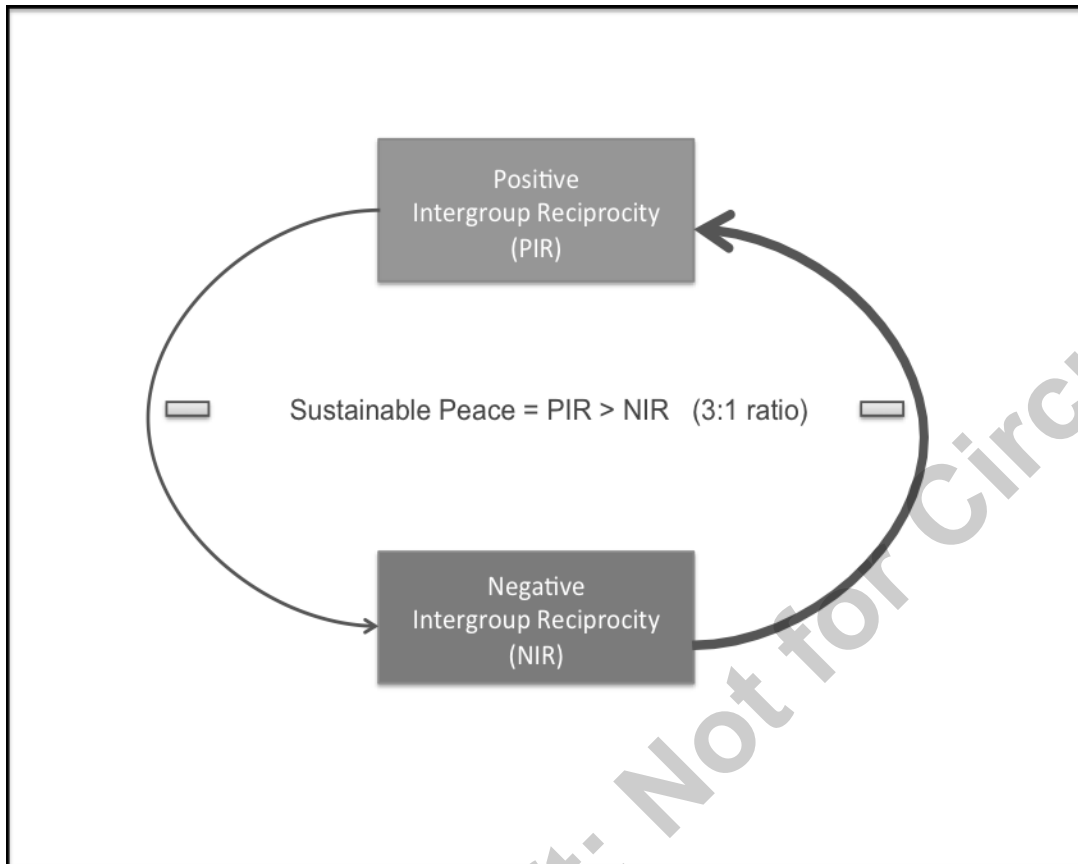


Figure 3: The nodal focus of the CLD of sustainable peace

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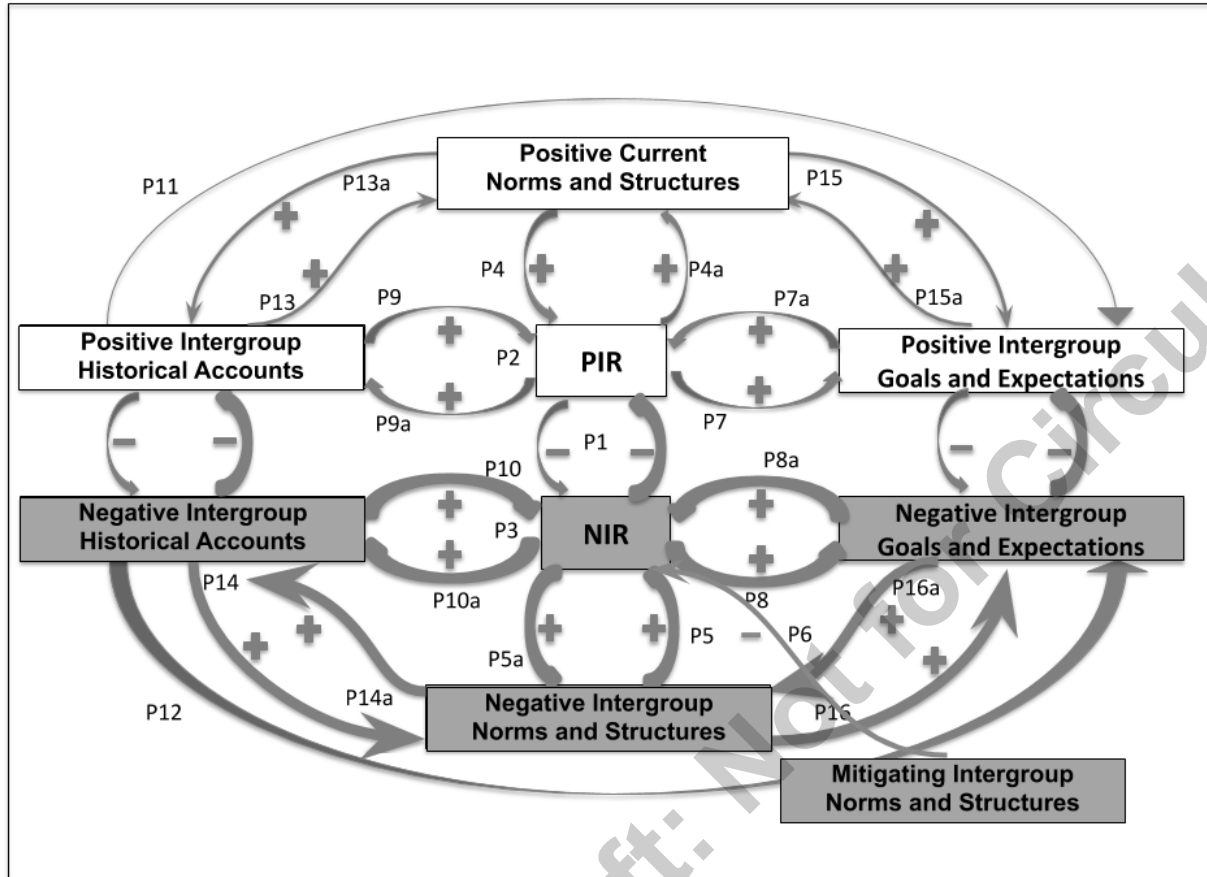


Figure 4: CLD of the core dynamics of sustainable peace