

Collaborative Dynamics in Collective STEM Reform Initiatives

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Goals of the Session

- Explore the dimensions of collaboration
- Explore how the dimensions manifest in collaborative STEM reform initiatives
- Explore how the dimensions can affect STEM reform projects



My Background

- The Center for the Integration of Research, Teaching, and Learning (CIRTL)
 - CIRTL as an organization/community of practice
 - The impact of CIRTL
 - The role of boundary spanners
- Global Center for Food Systems Innovation (Michigan State, USAID)
 - Multi-sector collaboration
- CIRTL INCLUDES Pilot
 - Measuring CI
- The NSF Aspire Alliance
 - Measuring CI, 2.0



Contextual Framing

- Extensive national interest in STEM education reform
- Considerable effort in defining effective teaching
- Faculty slow to adopt evidence-based teaching practices
- Siloed and disconnected reform efforts ineffective
- Systems/collaborative approach needed
 - Multiple levers of change needed simultaneously
 - Multiple stakeholders needed to engage to make change happen
 - More can occur collectively than individually



Collaborative STEM Reform Initiatives

- Individual-based membership
 - PULSE, SENCER
 - BioQuest Consortium
- Multi-institutional
 - CIRTl
 - Bayview Alliance
- Multi-sector
 - [Insert state name] STEM Network
- Networks of networks
 - NSF INCLUDES Alliances

Q1: With what other networks or collaborative initiatives are you familiar?

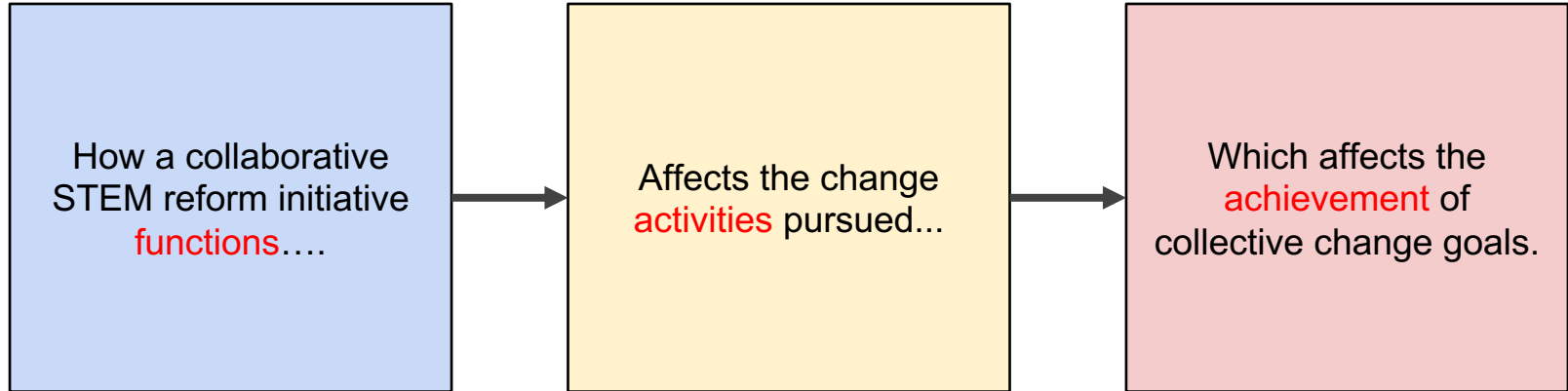


Why are Collaborative Dynamics Important?

- The underlying premise of systems-based/collaborative reform efforts is that working together can produce more change than individual stakeholders can do alone
- However, the focus is typically on change activities and outcomes/impact, often less on how the initiative functions as a collaborative entity
- **Main Point**: The collaborative process is just as important as the activities and outcomes of an initiative

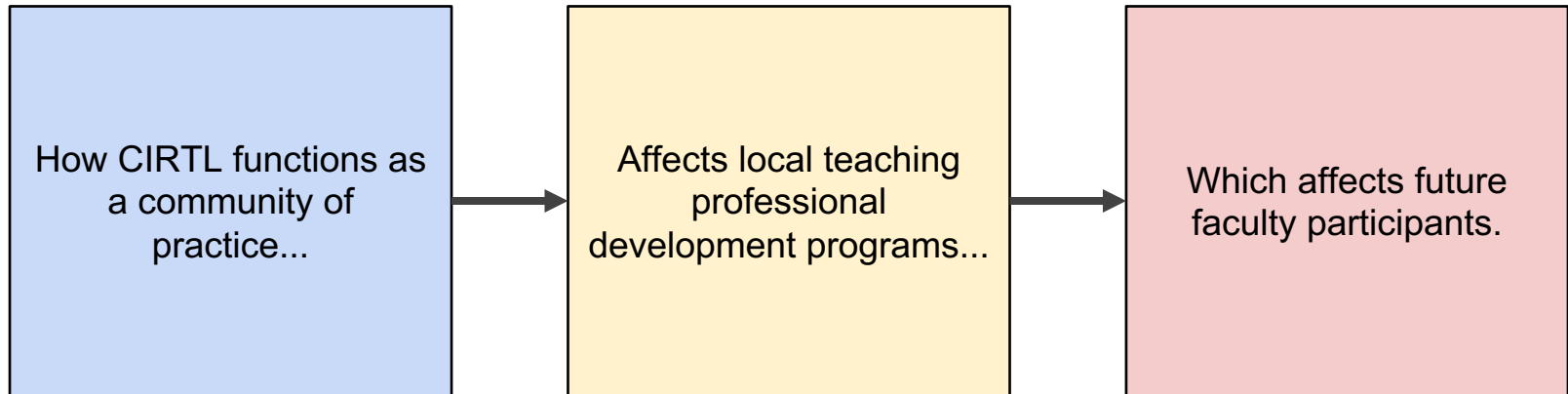


A Central Hypothesis







An Example



Q2: Think of your own networks or initiatives, see if can you easily come up with a similar progression and post it in the chat.



Existing Collaborative Models and Frameworks Used in STEM Reform





Collective Impact

- Common Agenda
 - Shared Measurement
 - Mutually Reinforcing Activities
 - Continuous Communication
 - Backbone Organization
-
- And....Principles of Practice, such as:
 - Include community members in the collaborative.
 - Build a culture that fosters relationships, trust, and respect across participants.
 - Cultivate leaders with unique system leadership skills.



**COLLECTIVE
IMPACT FORUM**

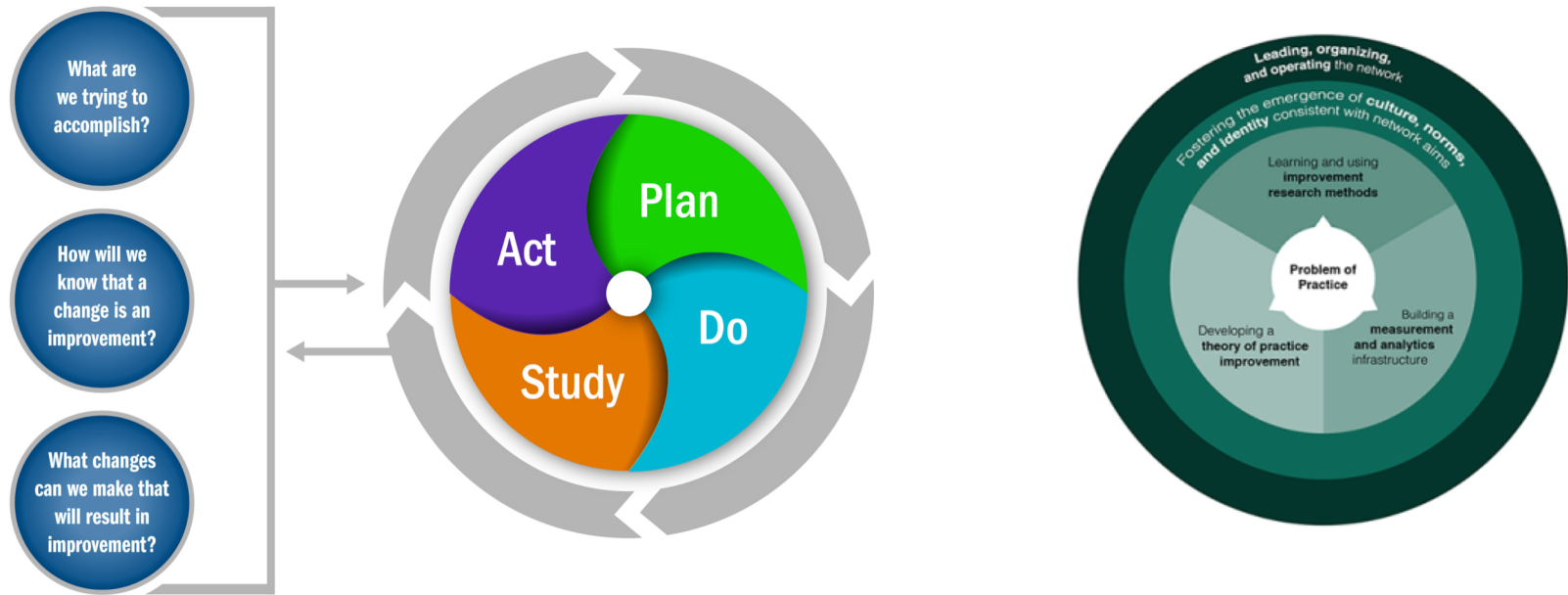


NSF's Collaborative Framework



- Vision
- Partnerships
- Goals and metrics
- Leadership and communication
- Expansion, Sustainability, and Scale

Networked Improvement Communities





Communities of Transformation*


**Kezar, A., & Gehrke, S. (2015). Communities of transformation and their work scaling STEM reform. Pullias Center for Higher Education, Rossier School of Education, University of Southern California.

Figure 10.1: Sustainability Model for Non-Organizationally Situated STEM Reform Communities of Transformation




Q3:

- In what ways have you used these existing frameworks in making sense of your collaborative work?
- What else have you used?



Literature on Collaboration: Building a Framework





Process

- Key Questions
 - What does existing literature say about collaboration in large, multi-institutional and multi-sector initiatives?
 - What helps or hinders the collaborative process?
 - In short, what should we consider in helping to build, evaluate, and study collaborative reform initiatives?
- Literature review
 - Focused on the identification of existing literature reviews, syntheses, frameworks, and models
 - Compared key elements across
 - Developed the Dimensions of Collaborative Dynamics Framework

Bentrup, 2001 (Environmental Management)

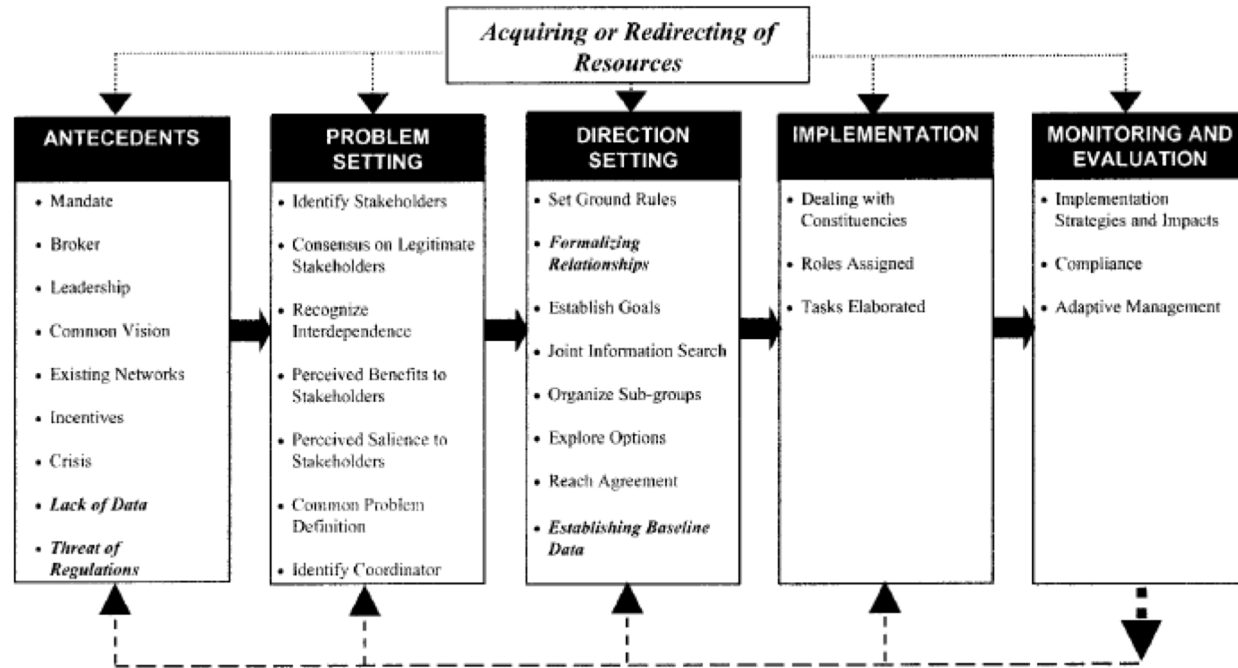


Figure 4. Revised collaborative model for environmental planning.

Thompson & Perry, 2006 (Public Administration)

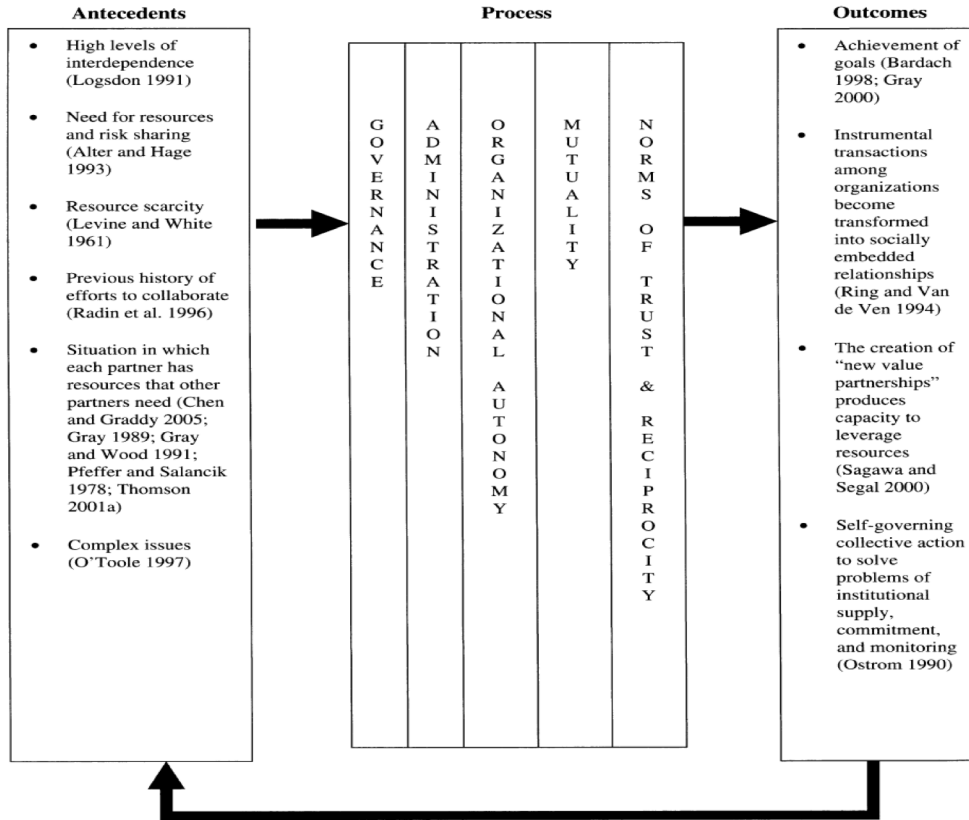
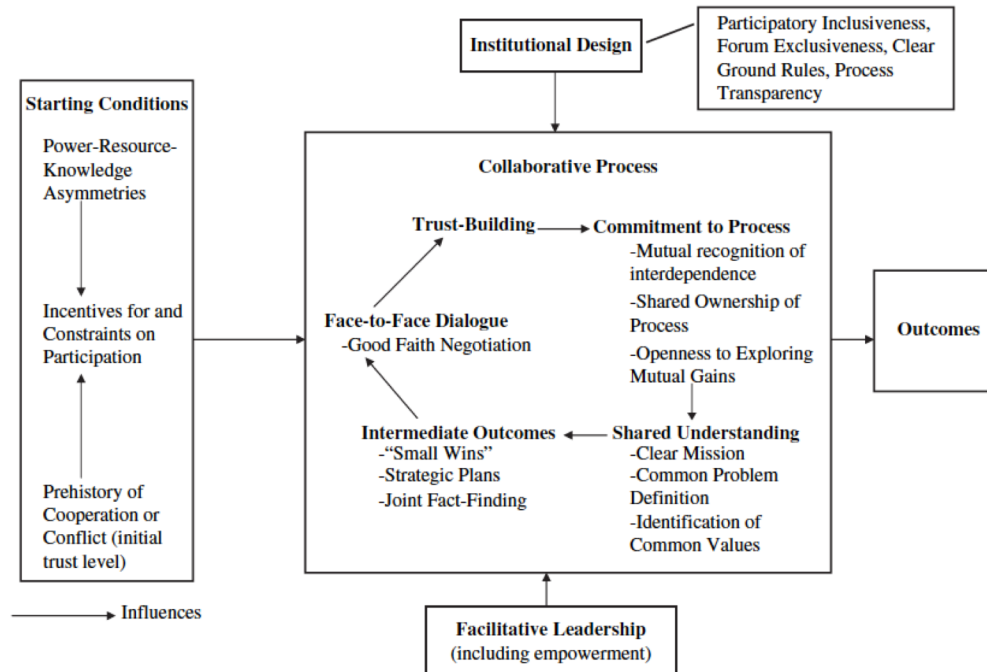


Figure 1 The Antecedent-Process-Outcome Framework
Source: Adapted from Wood and Gray (1991).

Ansell & Gash, 2008 (Public Administration)

Figure 1
A Model of Collaborative Governance



Clarke & Fuller, 2010 (Business)

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Amelia Clarke and Mark Fuller

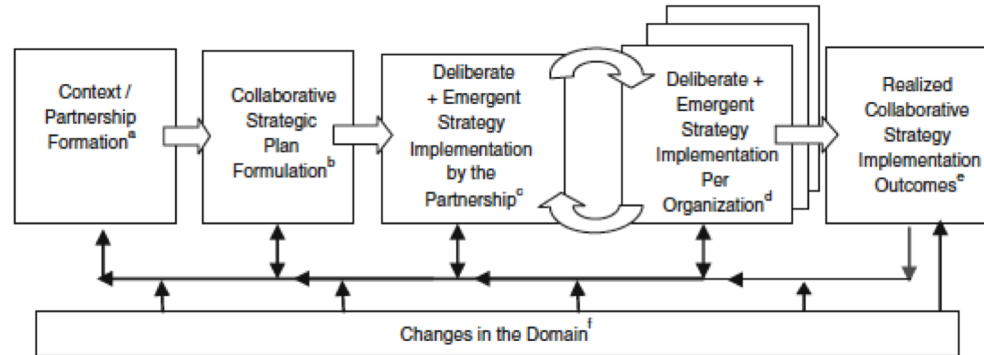
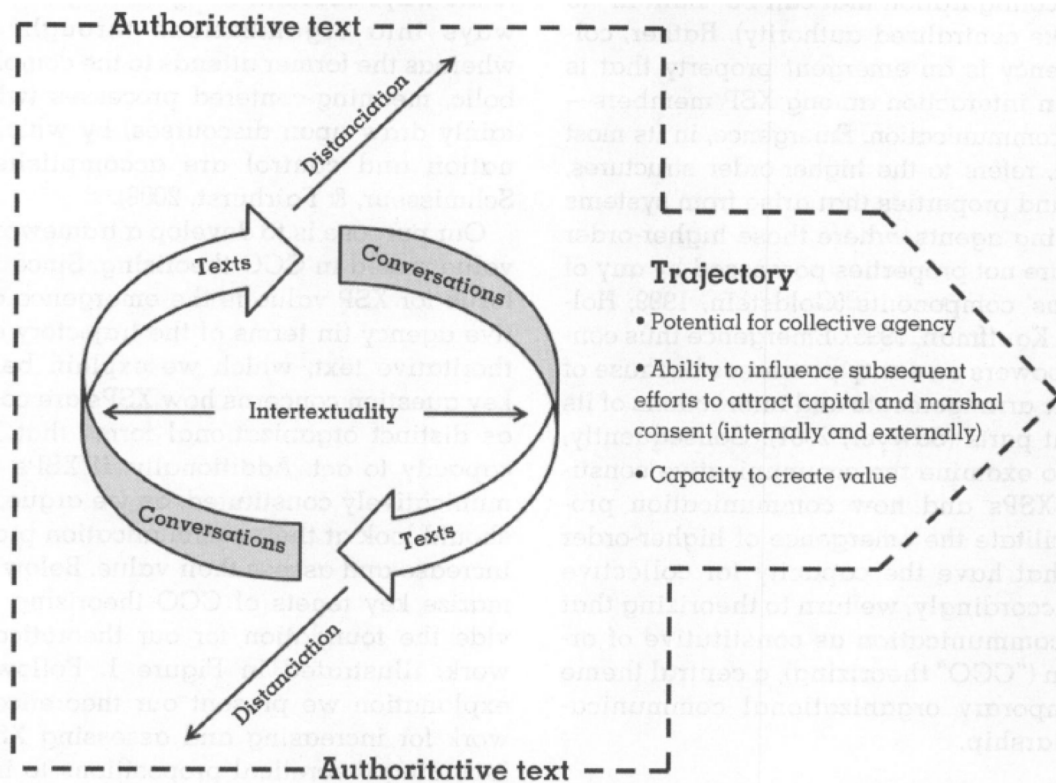


Figure 1. Process model of collaborative strategic management. ^aContext describes the situational considerations and partnership formation is the initial partners, their initial form, and their initial communication, and decision-making processes. ^bCollaborative strategic plan formulation is the strategic plan development by the partnership (for the partnership) and the plan's content. ^cDeliberate and emergent collaborative strategy implementation by the partnership is the actions taken by the partnership to further the collaborative strategic plan goals. ^dDeliberate and emergent collaborative strategy implementation per organization is the actions taken by the individual partners within their own organizations to further the collaborative strategic plan goals. ^eRealized collaborative strategy implementation outcomes are the results – plan, process, partner, person, outside stakeholder, and environment-centric outcomes. ^fChanges in the domain refers to changes that occur in the social problem domain that are outside the actions taken by the individual partner organizations or the partnership, yet have an impact on the collaborative strategy implementation outcomes and/or other stages of the process model.

Koschman et al., 2012 (Management)

FIGURE 1

Communicative Constitution of XSPs As Authoritative Texts with the Capacity for Collective Agency



| | Sole-Creation-----→ <u>Co-Creation</u> |
|----------------------------|---|
| SOURCES OF VALUE | |
| Resource Complementarity | Low-----→ High |
| Resource Nature | Generic-----→ Distinctive Competency |
| Resource Directionality | Unilateral-----→ Conjoined |
| Linked Interests | Weak/Narrow-----→ Strong/Broad |
| TYPES OF VALUE | |
| Associational Value | Modest-----→ High |
| Transferred Resource Value | Depreciable-----→ Renewable |
| Interaction Value | Minimal-----→ Maximal |
| Synergistic Value | Least-----→ Most |
| Innovation | Seldom-----→ Frequent |
| STAGES | Philanthropic-----→ Transactional-----→ Integrative→ Transformational |

Figure 2. Collaborative value creation spectrum

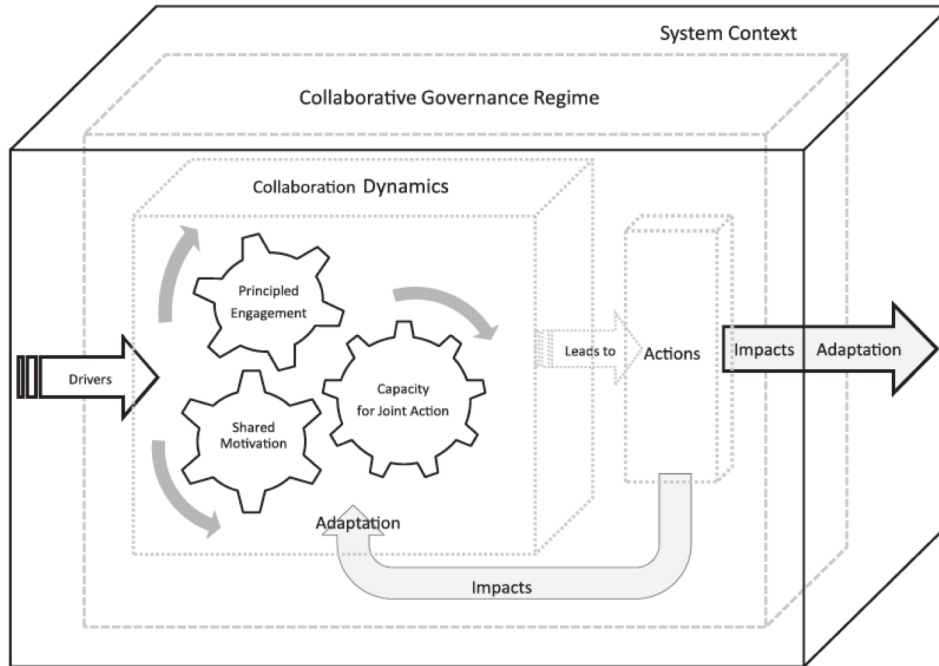
Source: Derived from Austin, J. E. (2000b). *The Collaboration Challenge: How Nonprofits and Businesses Succeed Through Strategic Alliances*. San Francisco, CA: Jossey-Bass; Austin, J. E. (2000a). Strategic Alliances Between Nonprofits and Businesses. *Nonprofit & Voluntary Sector Quarterly*, 29(1), 69-97.



Emerson, Nabatchi & Balogh, 2012

(Public Administration)

Figure 1
The Integrative Framework for Collaborative Governance



Emerson, Nabatchi & Balogh, 2012

Table 1

A Diagnostic or Logic Model Approach to Collaborative Governance

| Dimension and Components | System Context | Drivers | The Collaborative Governance Regime | | | | Collaborative Outcomes | |
|---------------------------|---|--|--|--|---|---|---|---|
| | | | Collaborative Dynamics | | | Outputs Collaborative Actions | Impacts | Adaptation |
| | | | Principled Engagement | Shared Motivation | Capacity for Joint Action | | | |
| Elements within Component | - Resource Conditions - Policy - Legal Frameworks - Prior Failure to Address Issues - Political Dynamics/ Power Relations - Network Connectedness - Levels of Conflict/Trust - Socio-economic/ Cultural Health & Diversity | - Leadership - Consequential Incentives - Interdependence - Uncertainty | - Discovery - Definition - Deliberation - Determination | - Mutual Trust - Mutual Understanding - Internal Legitimacy - Shared Commitment | - Procedural/ Institutional Arrangements - Leadership - Knowledge - Resources | Will depend on context and charge, but might include: - Securing Endorsements - Enacting Policy, Law, or Rule - Marshalling Resources - Deploying Staff - Siting/ Permitting - Building/ Cleaning Up - Enacting New Management Practice - Monitoring Implementation - Enforcing Compliance | Will depend on context and charge, but aim is to alter pre-existing or projected conditions in System Context | - Change in System Context - Change in the CGR - Change in Collaboration Dynamics |

Bedwell et al., 2012 (Human Resources)

W.L. Bedwell et al. / Human Resource Management Review 22 (2012) 128–145

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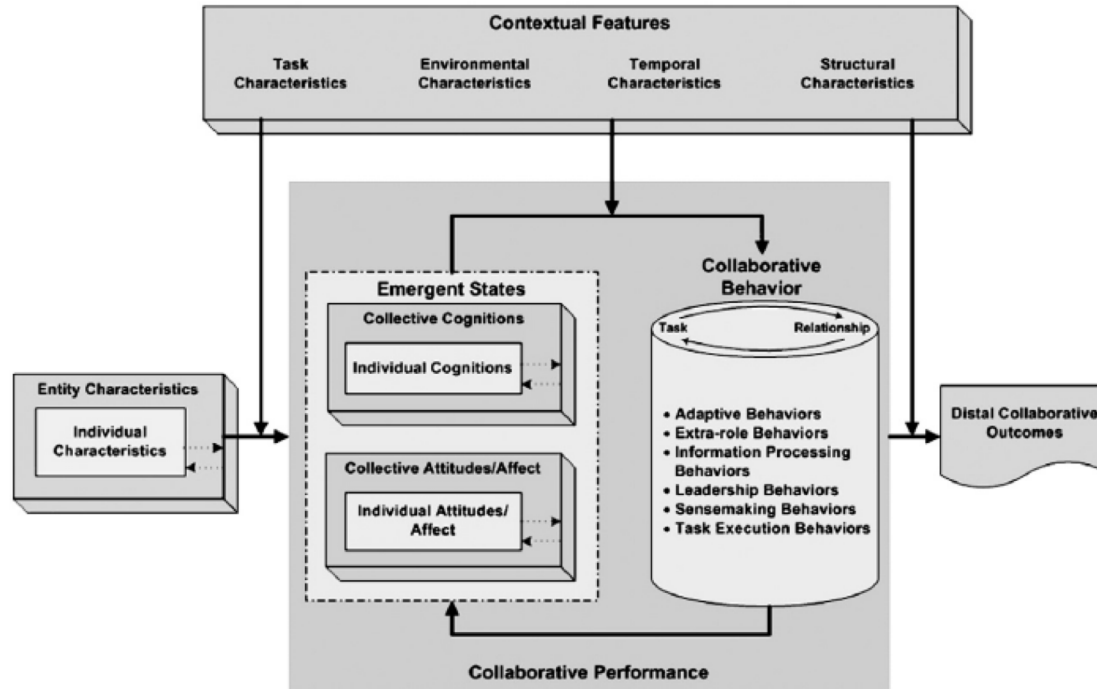


Fig. 2. Collaborative performance framework.

Bryson, Crosby, & Stone, 2015

(Public Administration)

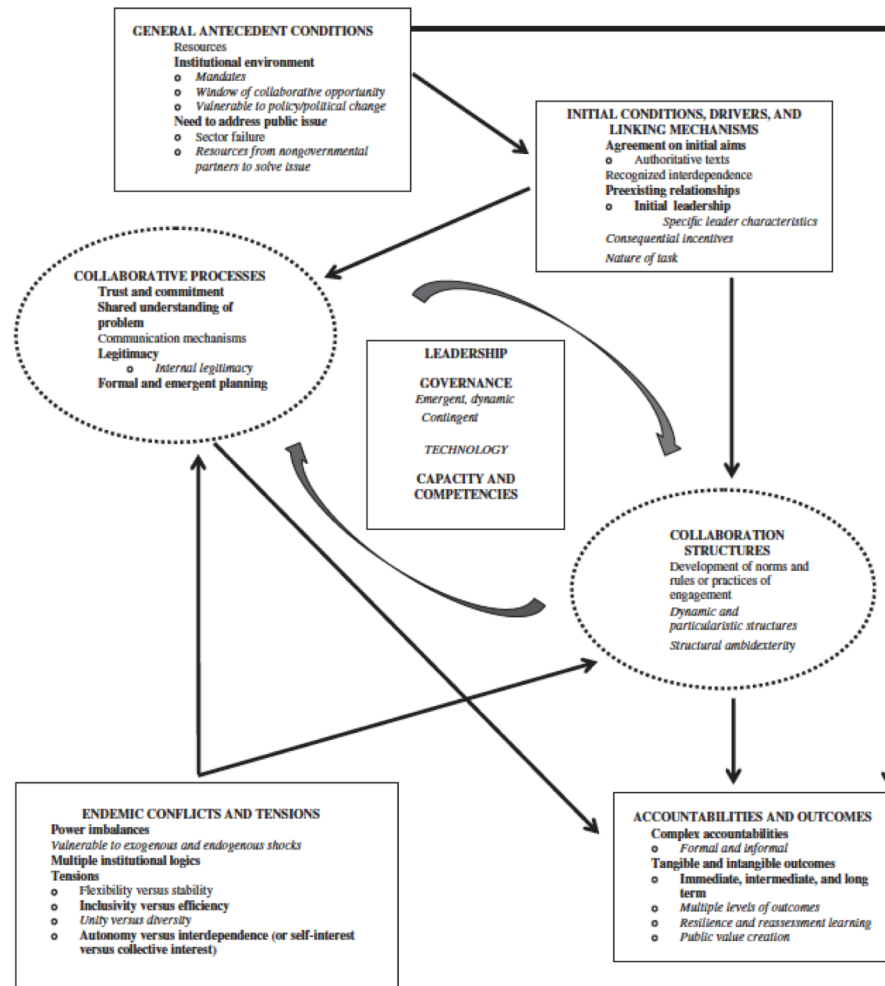
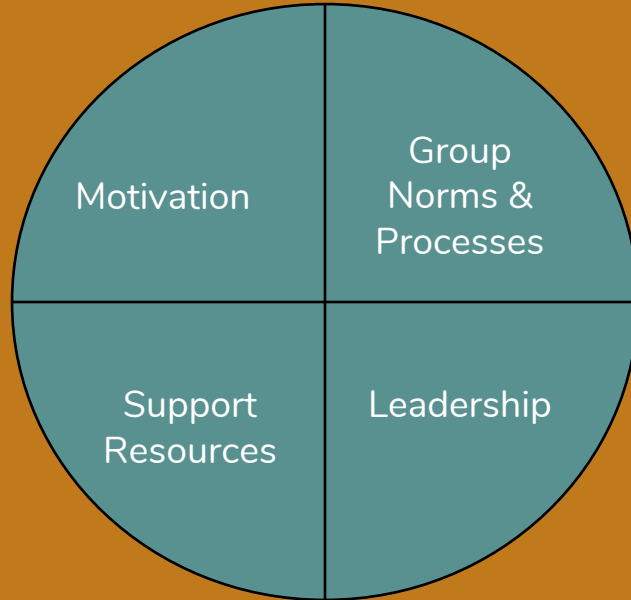


Figure 1 Summary of Major Theoretical Frameworks and Findings from Empirical Studies, 2006–15. Bolded elements are from both the theoretical frameworks and recent empirical studies; elements in italics are new elements from empirical studies

Dimensions of Collaborative Dynamics





Motivation

- History
 - The contextual precursors of the change initiative, including the **systemic context** of the problem being addressed, **prior reform activities** employed to address the problem, and prior partner/stakeholder **interaction**.
- Value
 - The **perceived value** of forming and continuing to engage in a collaborative initiative for participating individuals and organizations.
- Commitment
 - Individual and organizational commitment to the **mission, group norms and processes**, and **activities** of the change initiative.



Group Norms and Processes

- Congruity
 - The extent of congruence across and among partners and stakeholders in the change initiative, which includes factors of **commonality, autonomy, interdependence, and coordination**.
- Interaction
 - The nature of the mediums and mechanisms used in the change initiative to **communicate, exchange knowledge, build connections and relationships, and resolve conflict**.



Group Norms and Processes Con't

- Trust and Respect
 - The extent that individuals believe in the **reliability** and **character** of fellow partners and stakeholders in the change initiative and **respect** diverse perspectives and ideas.
- Accountability
 - The articulation, distribution, and execution of project **roles** and **responsibilities** in the change initiative in alignment with clear, mutual **expectations** for project members.



Group Norms and Processes Con't

- Equity, Diversity, and Inclusion
 - The wide representation and substantive **involvement** of stakeholders and partners affected by the problem of interest and **equitable distribution of power** to the benefit of diverse groups.
- Governance
 - The **decision-making** process to develop and implement rules, policies, and strategic directions of the change initiative.
- Improvement
 - The development and implementation of **shared metrics** (and other data collection) related to group dynamics, project activities, and project outcomes in service to organizational learning and **continuous improvement** in the change initiative.



Support Resources

- Availability
 - The availability of key resources in support of the change initiative, such as **funding**, **staffing**, **technology**, **time**, **expertise**, and a **backbone** organization.
- Allocation
 - The balanced or imbalanced **distribution of key resources** within the change initiative to support project functioning and the implementation of change activities.



Leadership

- Structure
 - The leadership structure of the change initiative including varying combinations of **distributive**, **hierarchical**, **formal**, and **informal** components.
- Attributes
 - The qualities of formal and informal leaders in the change initiative that help **convene** diverse individuals and organizations, **empower** stakeholders and partners, **build legitimacy** for the project, and **create enthusiasm** for collective change.

Concluding Thoughts

- Motivation, group norms & processes, support resources, and leadership are all VITAL in....
 - Developing a collaborative initiative
 - Convening stakeholders
 - Seeking support
 - Establishing leadership structures & processes
 - Evaluating the initiative over time
 - Diagnosing strategic areas of investment & improvement
 - Maintaining drive & passion for the cause of the initiative



Questions?

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