frontiers in Communication

HYPOTHESIS AND THEORY
published: 19 May 2020
doi: 10.3389/fcomm.2020.00028

Hypothesis and Theory: Collaborative Governance, Natural Resource Management, and the Trust Environment

*Claire Rapp**

School of Environment and Natural Resources, The Ohio State University, Columbus, OH, United States

Many natural resources are managed collaboratively by government agencies and affected stakeholders. Collaborative management is intended to reduce conflict, facilitate learning, and increase consensus among stakeholders. Previous work highlights the role of trust in developing a shared understanding and theory of change for participants in collaborations, but defines trust broadly. The presented work builds on a framework outlining four dimensions of trust important for collaborative natural resource management and argues there is a need to consider not only multiple forms of trust but multiple trust referents. In particular, it is proposed that the effect of individual trust on collaborative outcomes depends on the overall trust environment; when group trust is low individual trust has a limited effect on collaborative outcomes compared to when group trust is high. Measures to examine the multiple dimensions of trust and the trust environment are proposed. Practical implications for considering trust across dimensions and multiple trust referents are discussed.

Keywords: trust, collaborative governance, natural resource management, trust ecology, multi-level analysis

OPEN ACCESS

Edited by:
Dara M. Wald,
Iowa State University, United States

Reviewed by:
Erik W. Johnston,
Arizona State University, United States
Jennifer Peeples,
Utah State University, United States
Kirsten Mya Leong,
Pacific Islands Fisheries Science Center (NOAA), United States

***Correspondence:**
Claire Rapp
rapp.172@osu.edu

Specialty section:
This article was submitted to Science and Environmental Communication, a section of the journal Frontiers in Communication

Received: *08 January 2020*
Accepted: *16 April 2020*
Published: *19 May 2020*

Citation:
Rapp C (2020) Hypothesis and Theory: Collaborative Governance, Natural Resource Management, and the Trust Environment. Front. Commun. 5:28. doi: 10.3389/fcomm.2020.00028

INTRODUCTION

Collaborative governance challenges historical paradigm of top-down control and focuses on bringing affected stakeholders together to inform consensus-based policy and management (Ansell and Gash, 2008). Collaborative governance can reduce conflict, facilitate learning, and increase consensus among stakeholders (Weible and Sabatier, 2009; Leach et al., 2014). Stakeholder trust is important for cultivating collaborative dynamics and fostering positive outcomes of collaboration (Emerson et al., 2012; Siddiki et al., 2017). However, much of the discussion on trust in collaborative governance has been vague, with non-specific referents and dimensions of trust. This is problematic because trust is multi-dimensional (Stern and Coleman, 2015) and different forms of trust may have different effects on collaborative outcomes. Further it is unclear to what extent trust needs to be shared among participants. While diversity in the types of trust a stakeholder has seems to be beneficial for institutional resilience (Stern and Baird, 2015), the ramifications of diversity in levels of trust across stakeholders in a collaboration is less understood. Are trusting relationships additive or more than the sum of their parts? Can asymmetry undermine the benefits of trust in collaborative governance? Thus, there is a need to examine to what extent the effects of individual levels of trust on collaborative governance outcomes depend on the "trust environment."

Scholars have emphasized the importance of dedicating considerable time to developing trust between stakeholders for successful collaborative governance (Ansell and Gash, 2008) but have given little practical treatment to understanding the types of trust, how they develop, and what role they play. Research in organizational and management psychology suggests trust asymmetry can negatively impact team performance (de Jong and Dirks, 2012) and create "vicious cycles" of increasing distrust (Ferguson and Peterson, 2015). Extending and expanding trust asymmetry and multidimensionality to collaborative governance and natural resource management is important for understanding how to create successful collaborations and prevent attrition and disengagement. With a more nuanced understanding of what trust is important when, practitioners can better allocate their resources when investing in trust-building activities.

This paper begins with a review of collaborative governance and how collaborative governance frameworks conceptualize trust before providing a more in-depth review of the dimensions and function of trust in the natural resource management literature. A general hypotheses is stated and a research design is outlined, including possible measures for key variables and an example context to apply the research design. The role of multiple forms of trust and multiple trustees are considered with implications for practitioners. Finally, limitations and future directions are discussed.

THEORETICAL BACKGROUND

Collaborative Governance

Collaborative governance emerged as an alternative to more adversarial and conflict-oriented modes of governance (Ansell and Gash, 2008). In the United States in the 1980s and early 1990s, largescale collaborative governance programs emerged to address water quality, habitat, and forest management (Gerlak et al., 2012). In the decades since, collaborative governance has been the topic of considerable and diverse study which has led to a proliferation of definitions, concepts, and modes of research (Emerson and Nabatchi, 2015b). Indeed, collaborative governance is a broad term that can describe a wide arrange of institutional arrangements and government styles (Emerson et al., 2012). According to Emerson et al. (2012), collaborative governance is:

> "the processes and structures of public policy decision making and management that engage people constructively across the boundaries of public agencies, levels of government, and/or the public, private, and civic spheres in order to carry out a public purpose that could not otherwise be accomplished" (pg. 2)

In their integrative framework of collaborative governance, Emerson et al. (2012) describe three interacting components that drive collaboration dynamics: principled engagement, shared motivation, and capacity for joint action. Each component contributes to a synergistic "virtuous cycle" that drives collaborative actions. Principled engagement is a process of discovery, definition, deliberation, and determination that leads collaborations to build a shared theory of change (Emerson and Nabatchi, 2015a). Built on a shared understanding of the source of the problem and the goals for the landscape, the theory of change explains the scope of the problem and the actions available to collaborators. For example, to reach agreement on what management actions are appropriate for collaborative land management in the United States Forest Service, collaborators must develop a shared vision of what a "restored" landscape looks like, and come to agreement on the steps that will achieve that vision of restoration based on shared goals for collaboration-identified objectives such as recreational values, timber harvest, and wildfire risk mitigation (Urgenson et al., 2016). Shared theories of change are fluid, and change over time as the collaboration learns and refines its understanding of the problem. Without a shared theory, members may withdraw, which can undermine the efficacy of the collaboration. However, building shared motivation can help participants overcome the challenges to developing a shared theory of change. Shared motivation in turn fosters further principled engagement and builds capacity for joint action. A key component of shared motivation is trust, both interpersonal and inter-organizational (Emerson and Nabatchi, 2015a).

Trust is a key factor in successful collaboration, influencing commitment to the process and the development of shared understandings (Ansell and Gash, 2008). For example, researchers have suggested collaborative governance should lead to more learning than traditional adversarial approaches to policymaking, and this learning should in turn facilitate consensus and collective action (Leach et al., 2014). Trust is an important mechanism that drives learning: interpersonal trust allows collaborations to capitalize on their diversity and gain scientific, regulatory, economic, and relational knowledge (Siddiki et al., 2017).

However, despite its importance in collaborative governance, trust is often underspecified. Studies of collaborative governance and natural resource management suggest most collaborators generally feel increased trust over time as a result of the collaboration (Wagner and Fernandez-Gimenez, 2008; Rudeen et al., 2012; Levesque et al., 2017; Schultz et al., 2017) but often these studies do not specify what trust means or do not examine multiple trustees separately from each other (e.g., other participants, other institutions, or the collaboration as a whole as three separate trustees). This is problematic because one individual can experience trust across multiple dimensions for multiple trust referents and there is little reason to believe all forms of trust will lead to the same behaviors and outcomes (Stern and Coleman, 2015; Coleman and Stern, 2018b). Thus, there is a clear need to better specify and examine the nuances of trust and incorporate existing trust research in collaborative governance.

What Is Trust?

Trust has been the subject of considerable research over the decades, with researchers across disciplines and theories contributing diverse insight to our understanding. Trust involves a tripartite relationship where Trustor A trusts Trustee B to perform Action C (Mayer et al., 1995; Rousseau et al., 1998; Hardin, 2002). Trust is based on positive expectations of

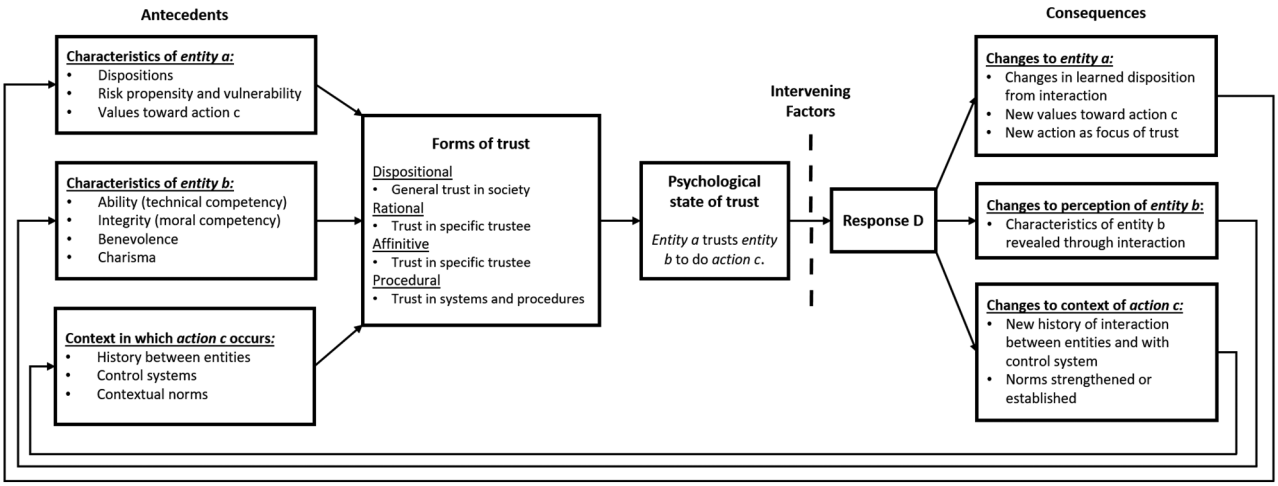

FIGURE 1 | Framework illustrating key components of trust theory (adapted from Stern and Coleman, 2015).

trustworthiness and willingness to be vulnerable to the actions of the trustee regardless of the ability to monitor the trustee's behavior (Fulmer and Gelfand, 2012). Trustworthiness has been most popularly described as a function of the trustee's integrity, ability, and benevolence (Colquitt et al., 2007; Schoorman et al., 2007). Thus, the level of trust is a function of characteristics of both the trustor and the trustee. Importantly, trust is an attitude, rather than a behavior. The willingness to be vulnerable does not necessitate vulnerability-inducing behavior: intervening factors, such as institutional constraints or perceived behavior control may prevent an entity from acting on their trust (Stern and Coleman, 2015).

Scholars have examined several dimensions of trust. Considerable research in natural resource management has examined social trust, a unidimensional trust construct based on the trustor's perceived similarity in values with the trustee (Earle and Cvetkovich, 1995; Vaske et al., 2007). Other dimensions of trust include ability-based trust and social-relational trust (Earle, 2010). Further, trust can be built affectively or cognitively (McAllister, 1995).

Trust has been the subject of considerable research in natural resource management. In particular, scholars have examined why, how, and when the public trusts natural resource management agencies, examining trust in a variety of natural resource management contexts such as endangered species management (e.g., Sponarski et al., 2014), forest and fuels management (e.g., Liljeblad and Borrie, 2006; Vaske et al., 2007), and cooperation and engagement with natural resource management agencies (e.g., Smith et al., 2013; Hamm et al., 2016). Stern and Coleman have summarized and coalesced trust research to describe four dimensions of trust in natural resource management. These are dispositional, affinitive, rational, and procedural trust (Stern and Coleman, 2015).

Dispositional trust is based on characteristics of the trustor and describes an individual's propensity to trust. Dispositional trust functions as the baseline, establishing initial levels of trust in uncertain situations and shaping subsequent trust development (Ferguson and Peterson, 2015). Affinitive and rational trust are based on assessments of the trustee. Affinitive trust comes from the research on social trust and organizational trustworthiness: it is based on perceived shared values and benevolence and integrity of the trustee. Rational trust is based on the predicted behavior of the trustee and the expected utility of trusting them. Rational trust comes from the economic traditions of trust (Hardin, 2002). Finally procedural trust is specific to the "system," rather than individuals or groups. Procedural trust is based on beliefs that procedures and rules are fair, transparent, and legitimate. Following the tripartite definition of trust, Stern and Coleman (2015) argue each of these dimensions of trust are influenced by characteristics of the trustor, trustee, and context in which the trusted action occurs. Their framework of trust theory is summarized and expanded on in **Figure 1**.

Each of these dimensions serves an important role, from establishing baseline levels of trust to subsidizing the risk of relying on other people through institutional assurances of fairness, and can build off each other, fostering trust across dimensions through repeated interactions. The interaction between trust types and how they function describe the trust ecology of an institutional setting (Stern and Baird, 2015). Like ecosystems, institutional arrangements that have trust diversity (that is, richness and evenness in their types and function of trust) are believed to be more resilient than institutional arrangements with few types or shallow levels of trust because breaches of trust in one dimension can be buffered by strong trust in another (Stern and Baird, 2015).

In collaborative governance, each type of trust may play an important role at different stages in the collaborative process. For example, in a case study of collaborative forest landscape restoration programs, affinitive trust was important for convening the initial members, but rational and procedural trust were more important for recruitment and maintaining commitment in the face of personnel turnovers (Coleman and

Stern, 2018b). This echoes the interactive and cyclical role of trust and shared motivation in sustaining commitment and collaboration (Ansell and Gash, 2008; Emerson et al., 2012) but adds important insight: trust as a general concept may be iteratively important but only if the type of trust evolves with the collaboration's needs.

Who Is Trusted?

Stern and Coleman (2015) highlight that the different dimensions of trust influence management outcomes, but not necessarily directly: trust, as an attitude, does not lead directly to trusting behavior but is dependent on the context and intervening factors. The trust ecology should be extended to include not just the different dimensions of trust, but the diversity of referents and the overall trust context as well. It is insufficient to only consider individual trustors and more precision is needed when outlining who are the trustees. Each individual either trusts or distrusts others in the collaboration, and is in turn trusted or distrusted. Further, trustors evaluate individuals, the organizations they represent, and the collaboration as a whole, creating trust across levels and dimensions. Additionally, trust may not be mutual and even at the dyad level there may be trust asymmetry (Korsgaard et al., 2015). Asymmetry can occur for many reasons, such as individual-level variance in propensity to trust (Ferguson and Peterson, 2015) or ambiguous and uneven cues that would prompt trust or distrust (Korsgaard et al., 2015).

In traditional hierarchical settings with a subordinate and a supervisor, the effect of trust on relevant outcomes between people may be simply additive, and mutual trust may be less important (Brower et al., 2009). However, in teams, asymmetry can undermine the positive effects of trust and be especially costly for the individual expressing higher trust (de Jong and Dirks, 2012). Given trust is dynamic and develops over time, asymmetry can trigger the opposite of a virtuous cycle: a vicious cycle of increasing distrust (Ferguson and Peterson, 2015). Thus, there is a clear need to understand how the effect of individual stakeholders' trust on collaborative dynamics is contingent on the overall trust environment.

HYPOTHESIS: INDIVIDUAL TRUST, THE TRUST ENVIRONMENT, AND A SHARED THEORY OF CHANGE

Trust is an important component of shared motivation which helps develop a shared theory of change (Emerson and Nabatchi, 2015a). However, trust may not increase equally across stakeholders in a collaborative management setting (Walpole et al., 2017) and trust may not be equally valued across all participants. In one study examining collaborative forest management in Oregon, federal decision-makers valued trust as an outcome of collaboration more and exhibited higher levels of trust than non-agency participants (Davis et al., 2017). Further, different dimensions of trust are semi-substitutable but, for example, interpersonal affinitive trust cannot substitute procedural trust or else collaborations are vulnerable to losing momentum when there is personnel turnover (Coleman and Stern, 2018b). Missing from this body of research is specification and examination of multiple trust dimensions and trust referents in one study. How trust affects whether a collaboration can develop a shared theory of change likely depends not only on the individual trustor, but the type of trust and the trust environment. Group trust, as a component of the trust environment, may positively contribute to shared theory development and simultaneously affect the relationship between individual trust and shared theory development. As summarized in **Figure 2**, group trust may be simply additive, may enhance the effect of individual trust, or may be both additive and multiplicative through a mixed effect. Further, these effects may depend on the trust dimension. For example, dispositional group trust may have an additive effect while group affinitive trust may have a multiplicative effect. To explore how this could be empirically examined, measures of each trust dimension and possible methods of analysis are proposed. The following hypothesis is proposed:

Hypothesis 1: The relationship between each dimension of individual trust (dispositional, affinitive, rational, and procedural) and the development of a shared theory of change depends on the level of group trust for that dimension: when group trust is higher, the effect of individual trust on perceived shared theory of change is stronger.

PROPOSED MEASURES AND ANALYSIS

Trust Items

Stern and Coleman (2015) do not provide items to measure their four dimensions of trust. However, they draw from several studies when describing each dimension of trust. Further, each dimension of trust has a rich body of literature behind it. These studies form the backbone of the proposed trust instrument. The following sections highlight measures other scholars have proposed for dispositional and affinitive trust and provide examples of how to frame them for collaborative natural resource management contexts (**Table 1**). For rational and procedural trust, novel items are proposed to measure each trust dimension in a natural resource management collaboration based on previous work exploring rational and procedural trust (**Table 2**). Each of these four measures focuses on individual members of the collaboration as the trustor. Group-level trust, where members of the collaboration as a whole are the trustor, can be measured by combining individual assessments, averaging measures of individual trust to get a single measure of group trust. Alternatively, one can measure group trust by asking individuals in the collaboration to answer from the perspective of the group as a whole (e.g., in the respondent's opinion, in general, how much do the members of the collaboration exhibit each dimension of trust).

Existing Measures of Dispositional and Affinitive Trust

Dispositional trust describes the individual-level propensity to trust of the trustor. The trustee is diffuse, representing society in general. This dimension is based heavily on the integrative model of organizational trust, which uses assessments of the general trustworthiness of different members of society, including

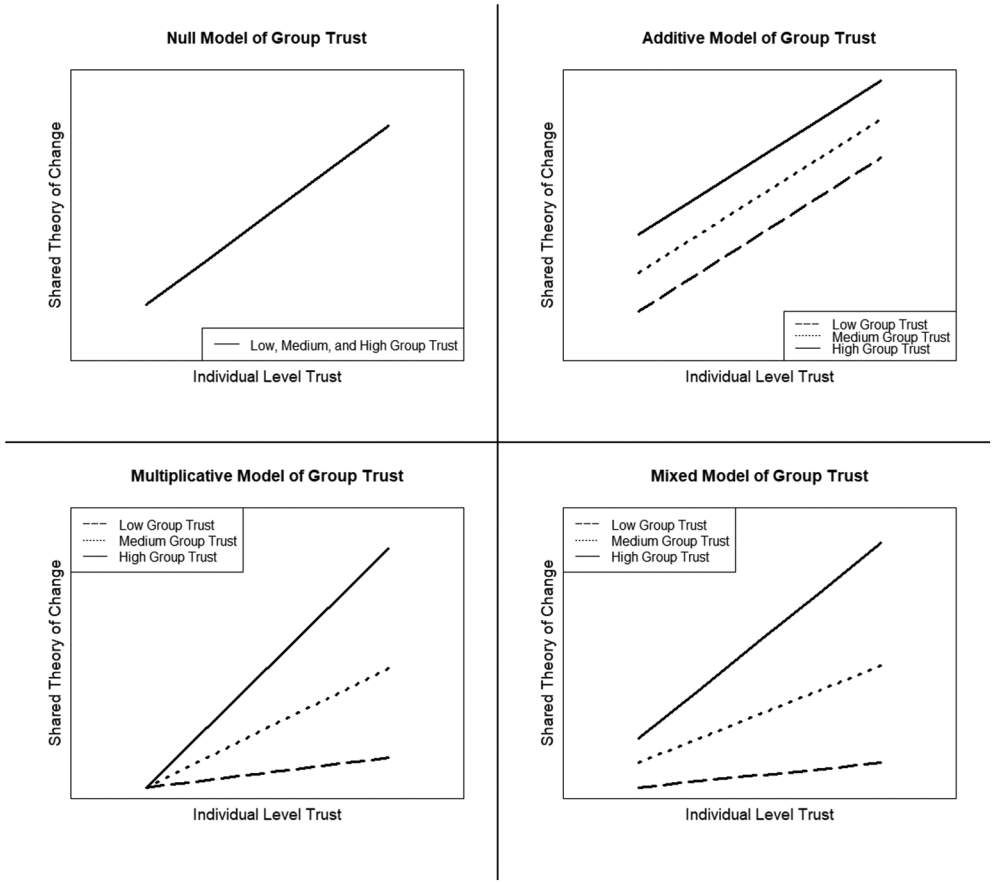

FIGURE 2 | Possible relationships between group trust, individual trust, and the development of a shared theory of change.

experts, strangers, salespeople, and people in general (Mayer et al., 1995; Mayer and Davis, 1999). Affinitive trust is based on the trustee's benevolence and integrity, which is informed by shared values, positive experiences, and identity and feelings of social connectedness. In this case, the trustee is members of the collaboration as a whole, although the trustee can be specified to be an individual or group. This dimension draws on the salient value similarities model of social trust which measures perceived shared values with the trustee (Siegrist et al., 2000; Vaske et al., 2007) and the integrative model of organizational trust, which measures perceived benevolence and integrity of the trustee (Mayer et al., 1995; Mayer and Davis, 1999).

Proposed Measures of Rational and Procedural Trust

Four novel items each are proposed as examples to measure rational and procedural trust. Rational trust is based on expected or perceived utility of interacting with the trustee. Rational trust develops when trustees communicate and act in ways that demonstrate benefits of trusting them that outweigh the costs. For example, individuals can build rational trust in collaborative games when other participants display repeated cooperative behavior (Johnston et al., 2011). Following norms, behaving predictably, and having positive past performance contribute to rational trust as trustors are able to assess the trustee's motivations (Hardin, 2002). Stern and Coleman (2015) do not highlight any specific instruments that measure rational trust. Like affinitive trust, the proposed measure focuses on rational trust in members of the collaboration as a whole, but these measures can be adapted to refer to individual or group trustees.

Procedural trust is based on trust in control systems. The trustee is not a particular individual or group of people, but rather the rules, institutions, or norms that govern a collaboration. Procedural trust develops when control systems make the trustor less vulnerable to the actions of others and people are confident the system uses fair procedures free from hidden manipulation (Hicks et al., 2008). Fair procedures are those that give individuals a voice by allowing them to present information that is acknowledged and considered in decision-making (Korsgaard et al., 1995) where decisions are made in an open, consistent, and equitable manner (Hicks et al., 2008). Stern and Coleman (2015) highlight studies that quantitatively measure procedural justice across diverse domains, but the wording is not readily applicable to collaborative natural resource management. A measure of procedural trust in natural resource management

TABLE 1 | Measures of dispositional and affinitive trust.

Construct	Source	Sub-dimension	Item
Dispositional trust	Mayer and Davis, 1999		One should be very cautious with strangers
			Most experts tell the truth about the limits of their knowledge
			Most people can be counted on to do what they say they will do
			These days, you must be alert or someone is likely to take advantage of you
			Most salespeople are honest in describing their products
			Most repair people will not overcharge people who are ignorant of their specialty
			Most people answer public opinion polls honestly
			Most adults are competent at their jobs
Affinitive trust	Mayer and Davis, 1999	Benevolence	Other members of this collaboration are very concerned about my welfare
			My needs and desires are very important to other members of this collaboration
			Other members of this collaboration would not knowingly do anything to hurt me
			Other members of this collaboration really look out for what is important to me
			Other members of this collaboration will go out of their way to help me
	Mayer and Davis, 1999	Integrity	Other members of this collaboration have a strong sense of justice
			I never have to wonder whether the other members of this collaboration will stick to their word
			Other members of this collaboration try hard to be fair in dealings with others
			Other members' actions and behaviors are not very consistent
			I like the values of other members of this collaboration
			Sound principles seem to guide the behavior of other members of this collaboration
	Siegrist et al., 2000; Vaske et al., 2007	Salient value similarity	With respect to this collaboration, I feel that other members share similar values as me
			With respect to this collaboration, I feel that other members share similar opinions as me
			With respect to this collaboration, I feel that other members think in a similar was as me
			With respect to this collaboration, I feel that other members take similar actions as I would
			With respect to this collaboration, I feel that other members share similar goals as me

should assess the extent to which the trustor believes there are transparent rules and procedures that allow meaningful contribution of members and provide equitable distribution of resources.

Perceived Shared Theory of Change

The shared theory of change describes the nature and size of the problem or challenge, the possible actions that can be taken, and the goals for the area in question. Measures of perceived shared theories of change should consider these three dimensions. Items are proposed to measure the three dimensions of the shared theory of change (**Table 3**). These items are broad and it is likely items will need to be tailored to the specific collaborative natural resource management project under study.

Covariates

Other variables are important to consider and analyze as covariates or controls in any examination of trust and collaborative governance given their effect on trust and/or collaborative outcomes. For example, previous research suggests individuals from powerful federal agencies experience and value trust differently than collaborative participants from other institutions (Davis et al., 2017; Walpole et al., 2017). An important covariate may be whether an individual is in a relatively more or less powerful institution, whether that institution is governmental or non-governmental, and whether their institution has sole implementation authority.

Further, collaborative governance regimes can take years to show positive ecological effects (Scott, 2015) and ecological

TABLE 2 | Measures of rational and procedural trust.

Construct	Possible item
Rational trust	I can reasonably predict the behavior of other members of this collaboration
	Other members of this collaboration follow predictable norms of behavior
	The benefits of relying on other members of this collaboration outweigh the costs
	Other members of this collaboration communicate their intentions clearly
Procedural trust	The rules of the collaboration apply equally to all members
	All members of this collaboration are treated fairly
	The process by which decisions are made in this collaboration is clear and transparent
	The benefits of collaborating are fairly distributed across members of this collaboration

TABLE 3 | Measure of shared theory of change.

Dimension of shared theory of change	Possible item: Members of this collaboration
Agreement on the nature of the problem	Agree on what it means to restore (location)
	Share an understanding of the ecological forces shaping (location)
	Share an understanding of the social forces shaping (location)
	Share an understanding of the economic forces shaping (location)
	Understand the management problems facing (location)
Agreement on the actions that can be taken	Agree on how to achieve the ecological goals of (location)
	Agree on how to achieve the economic goals of (location)
	Agree on how to achieve the social goals of (location)
	Agree on what management techniques can be used in (location)
Agreement on goals	Have similar goals for the future of (location)
	Have similar ecological goals for (location)
	Have similar economic goals for (location)
	Have similar social goals for (location)
	Want the same outcomes for (location)

outcomes are predicated on establishing collaboratively determined goals and implementation plans. Additionally how trust develops and what informs trust is dynamic over time as trustors and trustees repeatedly interact (Jones and Shah, 2016; van der Werff and Buckley, 2017; Grossman and Feitosa, 2018). It is likely the length of time individuals have been participating in the collaboration and the age of the collaboration itself affects the level of trust participants experience and their perceived shared theory of change. Including considerations of time, such as the age of the collaboration and how long each individual has been participating, are important for rigorous analyses of collaborations.

Multi-Level Analysis

Although there are many ways to analyze the trust environment depending on the specific research questions and hypotheses one is focusing on, a relevant example analytical method is highlighted for illustrative purposes. Multi-level modeling (MLM, also called hierarchical linear modeling and mixed modeling) is a technique used for nested data or clustered data where observations are not truly independent from each other but rather clustered based on higher-order characteristics (Hayes, 2006). For example, students are nested under schools, patients are nested under doctors, and collaborators are nested under collaborations (see Hicks et al., 2008 for an example of MLM and collaborative outcomes). MLM allows the coefficients of Level-1 independent variables to depend on Level-2 variables: in this case, the effect of individual-level trust on perception of a shared theory of change can vary with the Level-2 variable, overall group trust in the collaborative project. MLM is used to estimate Level-1 coefficients as either *fixed* or *random* effects. Whereas fixed effects are consistent across values of a Level-2 variable (i.e., consistent across clusters), random effects are allowed to vary across clusters and or as a function of cluster-level attributes.

MLM allows for progressively more complex models and can model additive, multiplicative, or mixed effects of Level-2 variables. Provided that perceived shared theory of change does vary across collaborations, one examines whether any variance in individual perceived shared theory of change can be explained by group-level trust (and individual-level trust). Ultimately, the most complex model of interest is the random slope and intercept model (also called a mixed effects or cross-level interaction model), where the average perceived shared theory *and* the effect of individual trust on shared theory depends on the group-level trust. Importantly, MLM requires multiple Level-2 observations. Where researchers only have a few collaborations to examine, MLM is not appropriate. However, one example where MLM may be appropriate is the Collaborative Forest Landscape Restoration Program.

EXAMPLE APPLICATION: COLLABORATIVE FOREST LANDSCAPE RESTORATION PROGRAMS

The Collaborative Forest Landscape Restoration Program (CFLRP) provides a useful example of how the trust environment could be examined quantitatively. Since 2009, the United States Forest Service has administered the CFLRP, a competitively-funded program designed to promote ecological, economic, and social sustainability in priority forests by developing 10-year collaborative restoration projects (Schultz et al., 2012). As of 2018, there are 23 projects funded through the CFLRP, covering over 15 million acres across 34 Forests in 14 states (Butler and Esch, 2019). Individual projects range from 130,000 acres to over 2.4 million acres. The projects are collaborative in that external stakeholders are encouraged to advise and provide input to the

Forest Service: CFLRP projects funding can only be spent on Forest Service lands, and the Forest Service retains ultimate decision-making authority. However, stakeholders provide input on project planning, implementation, and monitoring and may coordinate their activities with the Forest Service in light of Forest Service plans. Stakeholders and collaborative partners may include non-governmental organizations, other federal agencies, local and state agencies, Native American tribes, and private industries, while universities, non-profits, and private consulting firms may provide information and decision support (Butler and Esch, 2019).

Although many projects have not completed their 10-year funding cycle, scholars have already begun to examine what influences effectiveness and success in these collaborations. Developing a shared vision is key to success for CFLRP projects as collaborators move from broad statements they agree on to specific management practices (Urgenson et al., 2017). Although Urgenson et al. use the term shared vision, this is similar to the shared theory of change in the integrative framework for collaborative governance (Emerson and Nabatchi, 2015a). Ryan and Urgenson (2019) find collaborative capacity built on trusted leaders helps collaborations overcome the barriers to developing a shared vision, while a lack of trust can challenge CFLRP projects (Urgenson et al., 2017). Further, CFLRP projects can increase trust broadly defined, but not necessarily equally across stakeholders (Walpole et al., 2017).

Previous work by Coleman and Stern has explored the roles of affinitive, rational, and procedural trust in CFLRP projects (Coleman and Stern, 2018a,b). They find as members of CFLRP projects developed procedural, rational, and affinitive trust, members of the collaboration developed a shared understanding and came to consider compromise and management options they would not have supported before (Coleman and Stern, 2018a). While the three dimensions contribute to developing a shared understanding, they could also serve slightly different roles. As Coleman and Stern (2018b) describe, to be recruited to the collaboration, possible collaborators needed to rationally trust other collaborative members and trust the procedures of the collaboration. Procedural trust was necessary for continued participation and could serve as a springboard for the development of rational and affinitive trust. Taken together, these studies highlight key components of the integrative framework of collaborative governance relevant to CFLRP projects (Emerson et al., 2012). For these CFLRP projects, the different dimensions of trust can provide the motivation to recruit or maintain collaborative members, and build collaborative capacity. Utilizing this capacity, collaborators can engage in meaningful dialogue as part of a virtuous cycle that builds other forms of trust, all of which contribute to the process of co-creating a shared theory of change.

Given previous research has highlighted the role of different dimensions of trust in establishing a shared theory of change for CFLRP projects, these projects are possible opportunities for further refining of our understanding of the trust environment. The potential measures explored in the previous section can be used to assess the different levels of trust members of the 23 CLFRP projects have in society in general (dispositional), the rules and procedures of their collaboration (procedural), and other collaborative members (rational and affinitive). Further, these measures can be used to consider the effect of group-level trust on the process of developing a shared vision for CFLRP projects. While previous work on CFLRP projects provide rich examples of how individuals experiencing procedural, rational, and affective trust contribute to project outcomes, extending this work to assess group-level trust could provide key insight on how contextual factors affect the relationship between individual trust and collaborative outcomes.

DISCUSSION

Theoretical Implications

While collaborative governance can be an effective way to sustainably manage natural resources, not all collaborations are equally successful: some may be highly effective while others lack substantive impact and fail to move beyond broad agreement to address fundamental trade-offs (Bodin, 2017). Moving from broad agreement to specific management practices requires a shared vision among collaborators (Urgenson et al., 2016) as they develop a shared understanding of change (Emerson and Nabatchi, 2015a). Fostering shared motivation, including inter-organizational and interpersonal trust, facilitates the principled engagement that helps collaborators develop a shared theory of change (Emerson and Nabatchi, 2015a). Importantly, shared motivation is supposed to foster principled engagement in a virtuous cycle (Emerson et al., 2012) but it is important to recognize that it is not enough to simply have more units of shared motivation and principled engagement. Rather, the two grow but must also change and adapt. As collaborations move through the stages of principled engagement they discover, define, deliberate, and determine management actions. Different shared motivations may need to develop or collaborations may not be able to grow past their current phase. Thus, scholars should not just look to whether trust increases over time in successful collaborations, but how the dimensions of trust ebb and flow over time. Empirical work highlights the ways different forms of trust may vary in importance depending on the stage of the collaboration from convening, recruitment, and retention (Coleman and Stern, 2018b). However, more empirical work is needed to extend this analysis of the multiple dimensions of trust while connecting to theory and frameworks on collaborative governance. This work hopes to inspire future research integrating a more nuanced conceptualization of trust with existing theory on collaborative governance.

In addition this work also challenges future researchers to advance theory on the trust environment. Importantly, trust does not necessarily lead to trusting behavior; trust is the willingness to be vulnerable rather than the action of being vulnerable (Mayer et al., 1995; Rousseau et al., 1998). External factors can affect whether individuals act on their trusting attitudes (Stern and Coleman, 2015; Hamm, 2017). This article argues one of those external factors is the overall trust environment. How much all participants in a collaboration trust each other may influence whether, and how, individual trust affects collaborative outcomes. When only considering the effect of general trust

toward an ambiguous trustee, the trust-behavior gap may seem misleadingly wide as key relationships and non-linear effects are ignored. General trust is an imprecise and vague measure, and researchers risk missing interesting and important ways dispositional, rational, affective, and procedural trust in a variety of trustees at the individual and group level affect trustor behavior.

While there has been research examining the role of different forms of trust in collaborative governance, there is still a need to examine both the dimensions of trust and the broader trust environment simultaneously. This work proposes a guiding hypothesis to begin to examine how the trust environment informs collaborative natural resource management. While dispositional and affinitive trust have relatively popular scales to draw from, rational and procedural trust are less well-validated, and example items are proposed. Measuring trust as a unidimensional construct with an ambiguous trustee is insufficient. Previous researchers have made a compelling case for considering trust as a multi-dimensional construct, this work hopes to make a compelling case to consider and empirically measure multiple trust referents and the interacting influence they have on trust outcomes and collaborative management. In doing so, researchers may draw on and contribute to theory across disciplines, drawing on theories of interpersonal and intergroup relationships, individual perception of groups and institutions, and networks.

Practical Implications

Previous work on the trust ecology provides vivid examples of the importance of multiple dimensions of trust for practitioners (Stern and Baird, 2015; Coleman and Stern, 2018b) and outlines activities facilitators and coordinators of collaborations can engage in to cultivate the different dimensions of trust (Coleman et al., 2017) but practitioners should also consider each dimension of trust across multiple trustees and trustors. While this work explores the Collaborative Forest Landscape Restoration Program in greater detail to illustrate how the different dimensions of trust and multiple trust referents may influence outcomes, the trust environment has implications for many natural resource management collaborations. Some implications for practitioners for considering trust as a multi-dimensional construct across multiple trustors and trustees are considered here. Examples from the CFLRP are used to explore these implications.

Collaborations need space, flexibility, and time to develop at their own pace (Imperial et al., 2016). An important determinant of their initial pace may be dispositional trust. Although dispositional trust may become less important over time as individuals interact with each other and use those experiences as the basis of their trust (Jones and Shah, 2016), collaborators come in with a baseline propensity to trust which shapes their initial actions which may be critical in the early stages of a collaborative project. Asymmetry in dispositional trust can be problematic in dyads (Ferguson and Peterson, 2015). Practitioners may want to consider the dispositional trust of potential members when establishing a collaboration; as in dyads, it may be that too many collaborators inclined to distrust may slow the pace of trust development or even trigger a downward spiral worsening future trust relations. For example, would-be CFLRP collaborators considering how to build a project and planning the extent and potential relevant stakeholders should consider stakeholders carefully, balancing the need to be inclusive and the need to build shared commitment between stakeholders.

Further, practitioners should consider investigating who has high procedural trust and who has low procedural trust. The dimensions of trust may be semi-substitutable (Stern and Baird, 2015) but there is little reason to believe the substitutability is equivalent across actors. The effect of procedural distrust may depend on the power and position of the actor. In networks, powerful, central actors have higher generalized trust in the other members of their partnership (Berardo, 2009). For these actors, procedural trust may be less important because they may not consider themselves as vulnerable to the actions of other collaborators. However, historically disempowered or less central actors may disengage or fail to work productively without confidence that the rules and procedures of a collaboration will protect them and treat them equitably. In CFLRP projects, the Forest Service has the ultimate authority and implements all agreements derived from the collaboration. The procedural trust of Forest Service personnel, who occupy a relatively high-power position, may not be as important as the procedural trust of less powerful stakeholders who might otherwise engage in litigation if they do not accept the outcomes of the collaboration.

Similarly, practitioners should be cognizant that the effect of rational trust may also depend on the trustee. Rational trust can be built over time with repeated interaction that allows actors to display cooperative behavior (Johnston et al., 2011); thus practitioners may want to highlight small victories and positive process outcomes as a way to foster rational by making instances of cooperative behavior salient (Coleman et al., 2017). This also suggests in an environment categorized by high rational trust in the group, collaborators should carefully consider the inclusion of new stakeholders as the presence of a distrusted stakeholder may disproportionately impact cooperative behavior in an otherwise trusting group. In their work on stakeholder inclusion and collaborative governance, Johnston et al. (2011) find that new members of even strong collaborations can disrupt cooperative behavior. In these situations, trust in the group as a whole may be high but trusting behavior may be minimal due to a small number of "poison pill" collaborators. To avert this breakdown, collaborators may need to remove participants who are defecting in cooperative situations (Johnston et al., 2011).

Finally, there are practical implications worth considering for affinitive trust across levels. In particular, it is worth separating evaluating and addressing affinitive trust in individuals in a collaboration from affinitive trust in the groups these individuals represent. Coleman and Stern (2018b) discuss collaborators who had affinitive trust for other members of the collaboration but lacked rational trust in the group as a whole: while affinitive trust in individuals could serve as a stopgap when procedural trust was missing, it left collaborations vulnerable if specific trusted individuals left. It is worth exploring whether this vulnerability

could be addressed by developing affinitive trust not just toward individuals, but toward the agencies or groups they represent. For example, environmental or industry members of a CFLRP project may come to trust the values and benevolence of the individuals representing the Forest Service with or without trusting the values and benevolence of the Forest Service itself. However, if collaborators could serve as ambassadors of their stakeholder group and actively try to cultivate a more positive image, collaborations may be less vulnerable to the personnel turnover that otherwise undermines project success (Schultz et al., 2017).

LIMITATIONS AND FUTURE DIRECTIONS

The proposed research has several limitations and opportunities for future inquiry. First, although this research contributes to our understanding of the different roles of the dimensions of trust, it does so only rudimentarily. Further research would want to examine multiple outcomes that occur at different stages of collaboration to examine the role of different forms of trust over time. For example, future research could follow a nascent collaboration and track changes to the dimensions of trust over time and how that relates to collaborative outcomes, or future research could include a cross-sectional examination of several similar collaborations at different stages of the process and compare the dimensions of trust across them. Collaborations ebb and flow through stages of stability, reorientation, and re-creation (Imperial et al., 2016). Our understanding of the dynamic role of trust during this ebb and flow is limited. Including a time component in studies of trust and collaborative governance would provide a more nuanced understanding of the iterative nature of collaborative governance regimes and the virtuous cycles successful collaborations foster (Emerson et al., 2012) over their dynamic life cycle.

Second, this analysis provides initial insight into the effects of multiple levels of trust but more work needs to be done to understand the trust environment. The research question examined here focuses on individual and group trustors and their perception of three trust referents: society in general (dispositional trust), the people who make up the collaborative group as a whole (rational and affinitive trust) and the collaborative system (procedural trust). However, even at the individual level more trustees are worth considering. Future research could examine the difference between trusting individual people *as people* and trusting the institutions they represent. For example, it is easy to imagine a situation where a stakeholder trusts a government agency representative because they share the same values and the agency representative acts with integrity and benevolence. However, that same stakeholder may have negative evaluations of the character and values of the agency as an institution or be suspicious of government in general. It is worth considering individuals and the institutions they represent may be subject to different levels of trust. Future research could examine members of contentious and cooperative natural resource management collaborations to assess how collaborative stakeholders evaluate their relationships with each other and if and how they separate individuals from their institutions.

Finally, it is possible the different dimensions of trust interact with each other to influence collaborative outcomes. This analysis focuses on trust asymmetry across levels, but it is important to consider asymmetry in trust dimensions within one trustor and one trustee. For example, are the positive effects of having affinitive trust in a trustee magnified when the trustor also has high levels of rational trust? Further, this research has only examined the effect of group-level trust on individual-level trust of the same dimension, such as the effect of group-level affinitive trust on the relationship between collaborative outcomes and individual-level affinitive trust. This should be extended to consider cross-level dimensions of trust, such as the effect of group-level rational trust on the relationship between collaborative outcomes and individual-level procedural trust.

CONCLUSION

Research on collaborative governance suffers when key components of collaborative success are under-specified and under-theorized. Trust plays a critical role in collaborations but work in the collaborative governance literature has too often examined trust in broad terms with unclear referents. Trust is multi-dimensional, with each dimension contributing to collaborative outcomes. Future research on collaborative governance should embrace not only the multiple dimensions of trust but explicitly examine multiple trustors and trustees to shed light on the trust environment. This work hopes to catalyse that research by providing a theoretical justification for examining the trust environment and potential instruments and applications for conducting that research. These instruments are rudimentary and should be refined for the specific context they will be applied in. Further, scholars should consider other contextual forces that may shape the trust environment, such as age of the collaboration and relative power of the different actors. However, this work still provides a good foundation for future quantitative analysis of the trust environment of collaborative governance regimes.

AUTHOR CONTRIBUTIONS

The author confirms being the sole contributor of this work and has approved it for publication.

ACKNOWLEDGMENTS

The author would like to acknowledge and thank Kristina Slagle and Ramiro Berardo for their insight and commentary on an earlier draft.

REFERENCES

Ansell, C., and Gash, A. (2008). Collaborative governance in theory and practice. *J. Public Administr. Res. Theory* 18, 543–571. doi: 10.1093/jopart/mum032

Berardo, R. (2009). Generalized trust in multi-organizational policy arenas: studying its emergence from a network perspective. *Polit. Res. Q.* 62, 178–189. doi: 10.1177/1065912907312982

Bodin, Ö. (2017). Collaborative environmental governance: achieving collective action in social-ecological systems. *Science* 357:eaan1114. doi: 10.1126/science.aan1114

Brower, H. H., Lester, S. W., Korsgaard, A. M., and Dineen, B. R. (2009). A closer look at trust between managers and subordinates: understanding the effects of both trusting and being trusted on subordinate outcomes. *J. Manage.* 35, 327–347. doi: 10.1177/0149206307312511

Butler, W. H., and Esch, B. (2019). "Collaborative forest landscape restoration in action an overview of the cflrp cases," in *A New Era for Collaborative Forest Management: Policy and Practice Insights From the Collaborative Forest Landscape Restoration Program*, eds W. H. Butler and C. A. Schultz (Milton: Routledge), 18–42.

Coleman, K., and Stern, M. J. (2018a). Boundary spanners as trust ambassadors in collaborative natural resource management. *J. Environ. Plan. Manage.* 61, 291–308. doi: 10.1080/09640568.2017.1303462

Coleman, K., and Stern, M. J. (2018b). Exploring the functions of different forms of trust in collaborative natural resource management. *Soc. Nat. Resour.* 31, 21–38. doi: 10.1080/08941920.2017.1364452

Coleman, K., Stern, M. J., and Widmer, J. (2017). Facilitation, coordination, and trust in landscape-level forest restoration. *J. For.* 116, 41–46. doi: 10.5849/jof.2016-061

Colquitt, J. A., Scott, B. A., and LePine, J. A. (2007). Trust, trustworthiness, and trust propensity: a meta-analytic test of their unique relationships with risk taking and job performance. *J. Appl. Psychol.* 92, 909–927. doi: 10.1037/0021-9010.92.4.909

Davis, E. J., White, E. M., Cerveny, L. K., Seesholtz, D., Nuss, M. L., and Ulrich, D. R. (2017). Comparison of USDA forest service and stakeholder motivations and experiences in collaborative federal forest governance in the Western United States. *Environ. Manage.* 60, 908–921. doi: 10.1007/s00267-017-0913-5

de Jong, B. A., and Dirks, K. T. (2012). Beyond shared perceptions of trust and monitoring in teams: implications of asymmetry and dissensus. *J. Appl. Psychol.* 97, 391–406. doi: 10.1037/a0026483

Earle, T. (2010). Trust in risk management: a model-based review of empirical research. *Risk Anal.* 30, 541–574. doi: 10.1111/j.1539-6924.2010.01398.x

Earle, T., and Cvetkovich, G. T. (1995). *Social Trust: Toward a Cosmopolitan Society*. Westport, CT: Greenwood Publishing Group.

Emerson, K., and Nabatchi, T. (2015a). "Collaboration dynamics: principled engagement, shared motivation, and the capacity for joint action," in *Collaborative Governance Regimes* eds K. Emerson and T. Nabatchi (Washington, DC: Georgetown University Press), 57–80.

Emerson, K., and Nabatchi, T. (2015b). "Collaborative governance and collaborative governance regimes," in *Collaborative Governance Regimes* eds K. Emerson and T. Nabatchi (Washington, DC: Georgetown University Press), 14–35.

Emerson, K., Nabatchi, T., and Balogh, S. (2012). An integrative framework for collaborative governance. *J. Public Administr. Res. Theory* 22, 1–29. doi: 10.1093/jopart/mur011

Ferguson, A. J., and Peterson, R. S. (2015). Sinking slowly: diversity in propensity to trust predicts downward trust spirals in small groups. *J. Appl. Psychol.* 100, 1012–1024. doi: 10.1037/apl0000007

Fulmer, A. C., and Gelfand, M. J. (2012). At what level (and in whom) we trust: trust across multiple organizational levels. *J. Manage.* 38, 1167–1230. doi: 10.2139/ssrn.1873149

Gerlak, A. K., Heikkila, T., and Lubell, M. (2012). "The promise and performance of collaborative governance," in *The Oxford Handbook of US Environmental Policy*, eds M. E. Kraft and S. Kamieniecki (New York City, NY: Oxford University Press), 413–437.

Grossman, R., and Feitosa, J. (2018). Team trust over time: modeling reciprocal and contextual influences in action teams. *Hum. Resour. Manage. Rev.* 28, 395–410. doi: 10.1016/j.hrmr.2017.03.006

Hamm, J. A. (2017). Trust, trustworthiness, and motivation in the natural resource management context. *Soc. Nat. Resour.* 30, 919–933. doi: 10.1080/08941920.2016.1273419

Hamm, J. A., Hoffman, L., Tomkins, A. J., and Bornstein, B. H. (2016). On the influence of trust in predicting rural land owner cooperation with natural resource management institutions. *J. Trust Res.* 6, 37–62. doi: 10.1080/21515581.2015.1108202

Hardin, R. (2002). *Trust and Trustworthiness*. Russell Sage Foundation. Available online at: http://www.jstor.org/stable/10.7758/9781610442718 (accessed May 28, 2019).

Hayes, A. F. (2006). A primer on multilevel modeling. *Hum. Commun. Res.* 32, 385–410. doi: 10.1111/j.1468-2958.2006.00281.x

Hicks, D., Larson, C., Olds, D., and Johnston, E. (2008). The Ifnluence collaboration on program outcomes: the Colorado nurse-family partnership. *Eval. Rev.* 32, 453–477. doi: 10.1177/0193841X08315131

Imperial, M. T., Johnston, E., Pruett-Jones, M., Leong, K., and Thomsen, J. (2016). Sustaining the useful life of network governance: life cycles and developmental challenges. *Front. Ecol. Environ.* 14, 135–144. doi: 10.1002/fee.1249

Johnston, E. W., Hicks, D., Nan, N., and Auer, J. C. (2011). Managing the inclusion process in collaborative governance. *J. Public Administr. Res. Theory* 21, 699–721. doi: 10.1093/jopart/muq045

Jones, S. L., and Shah, P. P. (2016). Diagnosing the locus of trust: multilevel and temporal influences on perceived trustworthiness. *J. Appl. Psychol.* 101, 392–414. doi: 10.1037/apl0000041

Korsgaard, A. M., Brower, H. H., and Lester, S. W. (2015). It isn't always mutual: a critical review of dyadic trust. *J. Manage.* 41, 47–70. doi: 10.1177/0149206314547521

Korsgaard, A. M., Schweiger, D. M., and Sapienza, H. J. (1995). Building commitment, attachment, and trust in strategic decision-making teams: the role of procedural justice. *Acad. Manage. J.* 38, 60–84. doi: 10.5465/256728

Leach, W. D., Weible, C. M., Vince, S. R., Siddiki, S. N., and Calanni, J. C. (2014). Fostering learning through collaboration: knowledge acquisition and belief change in marine aquaculture partnerships. *J. Public Administr. Res. Theory* 24, 591–622. doi: 10.1093/jopart/mut011

Levesque, V. R., Calhoun, A. J. K., Bell, K. P., and Johnson, T. R. (2017). Turning contention into collaboration: engaging power, trust, and learning in collaborative networks. *Soc. Nat. Res.* 30, 245–260. doi: 10.1080/08941920.2016.1180726

Liljeblad, A., and Borrie, W. T. (2006). Trust in wildland fire and fuel management decisions. *Int. J. Wilderness* 12, 39–43. Available online at: https://ijw.org/april-2006/

Mayer, R. C., and Davis, J. H. (1999). The effect of the performance appraisal system on trust for management. *J. Appl. Psychol.* 84, 123–136. doi: 10.1037/0021-9010.84.1.123

Mayer, R. C., Davis, J. H., and Schoorman, D. (1995). An integrative model of organizational trust. *Acad. Manage. Rev.* 20, 709–734. doi: 10.5465/amr.1995.9508080335

McAllister, D. J. (1995). Affect- and cognition-based trust as foundations for interpersonal cooperation in organizations. *Acad. Manage. J.* 38, 24–59. doi: 10.2307/256727

Rousseau, D. M., Sitkin, S. B., and Burt, R. S. (1998). Not so different after all: a cross-discipline view of trust. *Acad. Manage. Rev.* 23:652. doi: 10.5465/amr.1998.926617

Rudeen, A. K., Fernandez-Gimenez, M. E., Thompson, J. L., and Meiman, P. (2012). Perceptions of success and the question of consensus in natural resource collaboration: lessons from an inactive collaborative group. *Soc. Nat. Resour.* 25, 1012–1027. doi: 10.1080/08941920.2011.653518

Ryan, C. M., and Urgenson, L. S. (2019). Creating and sustaining collaborative capacity for forest landscape restoration. *New Era Collab. For. Manage.* 3, 78–95. doi: 10.4324/9781351033381-5

Schoorman, D. F., Mayer, R. C., and Davis, J. H. (2007). An integrative model of organizational trust: past, present, and future. *Acad. Manage. Rev.* 32:344. doi: 10.5465/amr.2007.24348410

Schultz, C. A., Jedd, T., and Beam, R. D. (2012). The collaborative forest landscape restoration program: a history and overview of the first projects. *J. For.* 110, 381–391. doi: 10.5849/jof.11-082

Schultz, C. A., McCintyre, K., Cyphers, L., Ellison, A., Kooistra, C. M., and Moseley, C. (2017). *Strategies for Success Under Forest Service Restoration Initiatives*.

Available online at: https://ewp.uoregon.edu/sites/ewp.uoregon.edu/files/WP_81.pdf (accessed November 22, 2019).

Scott, T. (2015). Does collaboration make any difference? Linking collaborative governance to environmental outcomes. *J. Policy Anal. Manage.* 34, 537–566. doi: 10.1002/pam.21836

Siddiki, S., Kim, J., and Leach, W. D. (2017). Diversity, trust, and social learning in collaborative governance. *Public Adm. Rev.* 77, 863–874. doi: 10.1111/puar.12800

Siegrist, M., Cvetkovich, G., and Roth, C. (2000). Salient value similarity, social trust, and risk/benefit perception. *Risk Anal.* 20, 353–362. doi: 10.1111/0272-4332.203034

Smith, J. W., Leahy, J. E., Anderson, D. H., and Davenport, M. A. (2013). Community/Agency trust and public involvement in resource planning. *Soc. Nat. Resour.* 26, 452–471. doi: 10.1080/08941920.2012.678465

Sponarski, C. C., Vaske, J. J., Bath, A. J., and Musiani, M. M. (2014). Salient values, social trust, and attitudes toward wolf management in South-Western Alberta, Canada. *Environ. Conserv.* 41, 303–310. doi: 10.1017/S0376892913000593

Stern, M. J., and Baird, T. D. (2015). Trust ecology and the resilience of natural resource management institutions. *Ecol. Soc.* 20:14. doi: 10.5751/ES-07248-200214

Stern, M. J., and Coleman, K. J. (2015). The multidimensionality of trust: applications in collaborative natural resource management. *Soc. Nat. Resour.* 28, 117–132. doi: 10.1080/08941920.2014.945062

Urgenson, L. S., Ryan, C. M., Halpern, C. B., Bakker, J. D., Belote, T. R., Franklin, J. F., et al. (2016). Visions of restoration in fire-adapted forest landscapes: lessons from the collaborative forest landscape restoration program. *Environ. Manage.* 59, 338–353.

Urgenson, L. S., Ryan, C. M., Halpern, C. B., Bakker, J. D., Belote, T. R., Franklin, J. F., et al. (2017). Visions of restoration in fire-adapted forest landscapes: lessons from the collaborative forest landscape restoration program. *Environ. Manage.* 59, 338–353. doi: 10.1007/s00267-016-0791-2

van der Werff, L., and Buckley, F. (2017). Getting to know you: a longitudinal examination of trust cues and trust development during socialization. *J. Manage.* 43, 742–770. doi: 10.1177/0149206314543475

Vaske, J. J., Absher, J. D., and Bright, A. D. (2007). Salient value similarity, social trust and attitudes toward wildland fire management strategies. *Hum. Ecol. Rev.* 14, 223–232.

Wagner, C. L., and Fernandez-Gimenez, M. E. (2008). Does community-based collaborative resource management increase social capital? *Soc. Nat. Resour.* 21, 324–344. doi: 10.1080/08941920701864344

Walpole, E. H., Toman, E., Wilson, R. S., and Stidham, M. (2017). Shared visions, future challenges : a case study of three collaborative forest landscape restoration program locations. *Ecol. Soc.* 22, 1–15. doi: 10.5751/ES-09248-220235

Weible, C. M., and Sabatier, P. A. (2009). Coalitions, science, and belief change: comparing adversarial and collaborative policy subsystems. *Policy Stud. J.* 37, 195–212. doi: 10.1111/j.1541-0072.2009.00310.x

Conflict of Interest: The author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.