




Organizational Structure from Interaction: Evidence from Corporate Sustainability Efforts

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Abstract

We advance interactionist perspectives on how organizational structures emerge in new issue domains. Our study is grounded in field data collected over 18 months at a large biomedical company that sought to become more sustainable. Over that period, some sustainability-related issues became firmly embedded in formal structures and procedures, while others faltered. We identify the quality of situational interactions among organizational members as the engine behind the structuring of organizational sustainability efforts. Successful interactions generated traces of attention, motivation, knowledge, relationships, and resources that linked fleeting interactions to emergent organizational structures. Our findings point to the importance of internal advocates and distributed processes at middle and lower levels for developing organizational structures, and we show that advocates' interests, commitments, and identities are altered in the course of repeated interactions, as are the political resources available to them. Paying attention to situation-level interactions thus results in a more dynamic view of the emergence of formal structures through political processes. We develop a process model that informs structuration perspectives on organizational change by showing how social interaction dynamics can account for divergent levels of structuring within the same domain. The model also advances political perspectives on organizational change by unpacking the situational underpinnings of advocacy efforts and collective mobilization around issues.

Keywords: organizational change, structuration process, sustainability initiatives, social interaction dynamics

How activities are organized in new issue domains is a central and enduring question in organization theory. The structuring of organizational activities was a key concern of Max Weber's theory of bureaucracy and early organization

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theorists (Selznick, 1949; Gouldner, 1954; Chandler, 1962; Thompson, 1967). Formal and informal structures organize tasks and allocate decision-making authority, establish standard operating procedures and practice conventions, and enshrine priorities and subgoals within an issue domain. Organizational structures make action reliable and non-contingent on personal and situational factors and are therefore at the core of our understanding of organizations. Consequently, structures give shape to how organizations address new issues, such as new technologies (Barley, 1986), regulatory requirements (Dobbin and Sutton, 1998; Kellogg, 2011), or lines of business (Child, 1972). Classic work in the organization design tradition (e.g., Galbraith, 1977; Miles and Snow, 1978; Daft, 1983; Nadler and Tushman, 1988) suggested that an organization's formal and informal structures can, and perhaps should, be derived rationally from the goals and strategies it pursues. More recent scholarship has questioned the appropriateness of the rational design imagery and instead focused on the emergence of organizational structures from processes of distributed sense-making and mobilization. Current research is thus more concerned with the process of structuring than the selection and effectiveness of particular structures.

Research from the structuration perspective (Barley and Tolbert, 1997; Orlikowski, 2000) views structures as emerging from processes in which formal structures, routines, and policies are intertwined with interpersonal sense-making and adjustments.¹ Structuration theory emphasizes the mutual influence of actor-level practice and organizational context and hence questions of distributed agency. Work on the role of technological change, for example, suggests that new technologies are not a deterministic force but rather a starting point for participants' sensemaking, with contingent organizational outcomes (Barley, 1990; Orlikowski, 2000; Jarzabkowski, 2008). Others have suggested that institutions and routines, too, leave room for agency and hence change over time (Feldman and Pentland, 2003; Smets, Morris, and Greenwood, 2012). Structuration theory thus offers a comprehensive and versatile perspective for understanding the structuring of new domains.

A second body of work conceives of organizations as political systems and of structures as emerging from negotiations between organizational coalitions (see Briscoe and Gupta, 2016; Weber and Waeger, 2017, for recent reviews). In this open-polity perspective, organizations consist of divergent interests, coalitions, and rules for conflict resolution, and they interact with the external environment (March, 1962; Zald, 1970). New issues are interpreted by organizational members who can claim jurisdiction in the domain of change, so that new structures are shaped by their views (Dobbin and Sutton, 1998; Weber, Rao, and Thomas, 2009; Kellogg, 2011). When jurisdiction over an issue is unsettled, however, committed advocates can create formal structures through active change projects (Scully and Segal, 2002; Howard-Grenville, 2007; Briscoe and Gupta, 2016). This originally very structural perspective has recently become more concerned with political process. In particular,

¹ We use the broad term structuring to refer to the creation of organizational structures that organize a domain by means of formal and informal structures, where structures are features of the organization that limit the discretion of people's actions and thus create regularity in behavior. We reserve the term structuration for accounts of this process that employ the framework of structuration theory (Giddens, 1984).

preexisting structures and stable identities may be most important for processing routine and specific environmental demands, but for more ambiguous changes, jurisdictions, rules, and interests unfold and are renegotiated in interaction (Weber and Waeger, 2017).

While offering a realistic account of how new issue domains are structured in organizations—as emerging, increasingly formalized action patterns that are not contingent on personal or situational factors—neither body of work has fully addressed why selective and uneven structuration of issue domains occurs. Both lines of research most often study a process of progressive structuring in which recurrent activity in due course results in formal structures (Barley, 1986; Leonardi, 2007; Kellogg, 2009). Yet this focus gives rise to an empirical puzzle: formal and informal structures emerge sometimes but not always, in some new domains but not others, and, even within broader domains, for some issues at the expense of others. Likewise, sensemaking and mobilization activity can ebb and flow, so that organizational structures around new issues sometimes emerge rapidly and other times slowly or not at all. For example, why do some practices within a broad domain such as sustainability become enshrined in organizational structures, such as CO₂ reduction goals and reporting systems, while others do not? Or, when addressing equal opportunity, why do some aspects become formalized, such as formal hiring policies, while others, like training and promotion practices, do not? Since complex organizations often face multiple issues that can be addressed in multiple ways, we need to better understand when issues become enshrined in formal structures and when they do not.

A conceptual question underlying this empirical puzzle is what drives structuring processes forward toward greater organization-level formalization? Work in both the structuration and open-polity traditions has emphasized the mutual reinforcement of emergent structures and ongoing activity, resulting in a process that, once started, is expected to maintain its momentum toward greater structuring (e.g., Meyerson, 2003; Jarzabkowski, 2008; Heinze and Weber, 2015). Explanations for variations in the extent of structuring mostly turn to initial structural conditions (Kellogg, 2009) or context factors that are treated as external to structuring processes (Perlow, Gittel and Katz, 2004; Jarzabkowski, 2008). If initial conditions or context factors are the same, however, variation would have to be explained from within the structuring process. Yet it is less clear from existing research where variation originates in the overall process.

In this paper we seek to address this gap by revisiting the question of how new organizational issue domains become structured. We analyzed field data that we collected over an 18-month period at “Alpha” (pseudonym), a large biomedical company responding to societal demands to become more sustainable. During our fieldwork, employees at various units considered a wide array of potential sustainability issues that the company could address. Alpha initiated a number of sustainability initiatives, some of which thrived and became highly formalized, while others faltered. We analyzed the trajectories of several emerging issues in this domain and, from that, developed a model that accounts for the uneven extent of structuring between issues and locates the driver of the process.

STRUCTURE FROM INTERACTION

Structuration approaches to organizational change draw inspiration from Giddens' (1979, 1984) theory, which seeks to integrate the role of agency and structure in the reproduction and change of social orders. The term structuration is used both to describe an ongoing process and the extent to which structures have been produced. In organization theory, organizational structures, in the form of roles, policies, and procedures, often take the place of the societal structures and institutions in Giddens' social theory. Structuration has proved to be a useful lens for studying technological change in organizations (Barley, 1986, 1990; DeSanctis and Poole, 1994; Orlikowski and Barley, 2001). The theory draws attention to how formal organizational structures are enacted in small-scale and informal practices that involve some degree of discretion by participants. At the same time, these actors are situated in existing organizational structures that influence their understandings and activities, giving rise to the notion of embedded agency (Garud and Karnøe, 2003). An important implication of the structuration model is that the structuring of issue domains is likely to be path-dependent, improvised, and open-ended, iterating between ephemeral understandings in small-scale interaction situations and structural conditions that transcend these situations (Orlikowski, 1996; Barley and Tolbert, 1997; Perlow, Gittell, and Katz, 2004; Leonardi, 2007, 2011; Smets, Morris, and Greenwood, 2012).

The structuration framework includes the dimension of power and allows for divergent interests and conflict (Giddens, 1984), though applications to the structuring of organizations have historically emphasized distributed sensemaking and practice coordination over processes of active advocacy and conflict. By contrast, work that conceives of organizations as open polities casts the structuring of new issue domains as active projects promoted by advocates and often resisted by others (see Briscoe and Gupta, 2016; Weber and Waeger, 2017, for recent reviews). Research in this perspective has focused, on the one hand, on organizational members who are connected to societal causes and thus hold principled commitments to certain issues, as "tempered radicals" (Meyerson and Scully, 1995), "internal movement activists" (Lounsbury, 2001; Scully and Segal, 2002; Raeburn, 2004; Briscoe, Gupta, and Anner, 2015), or "issue sellers" (Dutton, Ashford, and O'Neill, 2001; Bansal, 2003; Howard-Grenville, 2007). On the other hand, it has focused on organizational groups that can claim jurisdiction over a domain and thus shape organizational policies and structures (e.g., Dobbin and Sutton, 1998, for personnel professionals and human resource management; and Chandler, 2014, for ethics and compliance officers). Recent work has increasingly emphasized the dynamics of collective mobilization—how coalitions are formed through interactions among organizational members and how those coalitions promote change (Scully and Segal, 2002; Kellogg, 2009). The focus on the dynamics of issue-based mobilization has put interactions among organizational members at the center of change and brought research in this tradition closer to structuration approaches that emphasize similar dynamics in the emergence of organizational structures.

While research in both the structuration and open-polity traditions identifies social interaction as a micro-foundation of political mobilization and structure emergence, neither has addressed why some issues become highly formalized

while others remain a provisional or tenuous part of organizational practice. Structuration research focuses either on cases in which changes in structure happened (Gray, Purdy, and Ansari, 2015) or on unpacking the interplay between structure and action, affirming the structuration framework (Tsoukas and Chia, 2002; Vaara and Whittington, 2012). Political process research suggests that issue advocates and coalition building matter (Bansal, 2003; Heinze and Weber, 2015), highlighting advocates who promote issues that align with social identities (Meyerson and Scully, 1995; Meyerson, 2003) or disciplinary backgrounds (Weber, Rao, and Thomas, 2009; Truelove and Kellogg, 2016) that emerged outside the organization. Yet this work leaves open how committed advocates' interests, commitments, and identities evolve over time, as well as how they decide what tactical issues to focus on. For example, in their study of employees who promote gender equality, Dutton et al. (2002) showed that their issue-selling efforts are influenced by situational factors and thus vary over time, but they do not directly address how such fluctuations come about. In a similar vein, Meyerson and Scully (1995) identified challenges for organizational activists in maintaining or increasing their commitments and energy but did not address under what conditions those challenges are overcome. And Howard-Grenville (2007) showed how the skills of advocates, as well as the resources they can bring to bear, evolve over time but did not link such changes to the creation of formalized organizational structures.

A related gap is the emphasis on interaction opportunities at the expense of the interaction process in structuring new issue domains. Structuration research and work from the polity perspective give central importance to recurrent interaction activity, from which structure emerges. Work on mobilization in organizations identifies critical structural opportunities for interactions in the form of free spaces and cross-unit networks that allow advocates to build coalitions and generate resources (Kellogg, 2009; Rao and Dutta, 2012; Heinze and Weber, 2015; Truelove and Kellogg, 2016). Structuration work places less emphasis on effortful projects for change, instead emphasizing precipitating events and the recurrence of more mundane interactional practices as central to structural change (Barley, 1990; Perlow, Gittell, and Katz, 2004; Leonardi, 2007; Smets, Morris, and Greenwood, 2012). For example, Barley (1986) showed how the introduction of a new technology—CT scanners in radiology departments—altered the workplace roles of radiologists and technicians and their recurring interactions, which over time resulted in changes in organizational structures. Conversely, Jarzabkowski's (2008) study showed that ongoing interactions among strategy makers influenced both people's interpretations and organizational structures, but to different degrees depending on the initial extent of institutionalization and on whether structures and interpretations changed at the same time or in sequence. Structuration and open-polity frameworks have in common that organizational structures are likely to change or emerge as long as interactions are enabled and happen. Yet the notion of emergence masks the question of what animates and drives structuration and mobilization processes forward to different degrees. If ongoing interaction generates structures that in turn pattern interactions, why might the process sometimes progress and other times come to a halt?

Our empirical exploration of these questions—as reported below—led us to draw on work that sees organizations as interaction systems (Gouldner, 1954; Weick, 1979; Daft and Weick, 1984). This conceptual move means treating the

interaction instead of individuals or practices as the basic unit of analysis (Goffman, 1983). This work is grounded in social interactionist work in sociology (Goffman, 1983; Collins, 2004) and social psychology (Weick, 1979, 1995; Ross and Nisbett, 1991), which we found can inform research on mobilization and structuration by unpacking the situational foundations of the process of emergence of informal and formal organizational structures (Powell and Colyvas, 2008; Leonardi and Barley, 2010). At the heart of situational interactions is what Weick (1979) termed the “double interact,” in which organizing occurs when someone says something, receives a response, and adjusts the initial statement as a result. Cycles of interaction situations facilitate collective sensemaking and the enactment of a more structured environment (Weick, 1995; Collins, 2004; Perlow, Gittell, and Katz, 2004; Maitlis, 2005; Maitlis and Christianson, 2014). Yet research from an interactionist perspective so far lacks a systematic exploration of the mechanisms through which such situational dynamics result in trans-situational organizational structures. Recent theorizing has instead focused on how the external environment influences organizational interactions, for example, by destabilizing them and giving rise to turmoil and conflict (Binder, 2002; Hallett, 2010). While we can thus expect interaction situations to matter for the structuring of new issue domains, when and how small-scale interactions translate into more stable organizational response patterns remains underexplored (Owen-Smith, 2011; McEvily, Soda, and Tortoriello, 2014).

METHOD

Research Setting

We studied the structuring of organizational sustainability efforts at Alpha, a large international medical devices company with headquarters in the United States. Alpha’s organization combined product, functional, and geographic units. Over the past 25 years, Alpha has, to some extent, embraced the mandate for sustainability. Alpha is listed on the Dow Jones Sustainability Index and was an early adopter of sustainability reporting. The company participates in voluntary stakeholder organizations, especially those related to environmental issues. These actions in many ways are comparable to Alpha’s peers and competitors who have also adopted sustainability reporting and created internal structures to address environmental issues.

Historically, Alpha had concentrated its sustainability initiatives in the Safety Health and the Environment (SHE) group. As the SHE vice president noted, “We did stuff. But we were doing it. It was SHE driven.” During the time of our study, the CEO of Alpha was recognized throughout the company as a proponent of sustainability and offered opportunities for addressing sustainability issues beyond the SHE group. As a business unit vice president who was not specifically involved in sustainability himself said, “Obviously, sustainability is important to [Alpha’s CEO] so it should be important to all the employees and shareholders. We should be considering it as we, you know, as we make decisions.”

Even though the CEO highlighted the importance of sustainability for Alpha, he did not dictate specific sustainability initiatives but rather encouraged broader engagement. He recognized that sustainability action required

multidivision responses and felt the siloed structure of SHE was problematic for responding to sustainability challenges. Shortly before we began this study, Alpha addressed this by launching a Sustainability Steering Committee staffed with line executives from different units and reporting to the CEO. This committee was tasked with developing a strategic approach to sustainability through coordinating Alpha's new and existing initiatives and defining company-wide "priority areas"—an organizational agenda of issues in the domain of sustainability. At the beginning of our study, it was unclear how Alpha would structure its efforts in the sustainability domain. During our study, the Steering Committee, and several working groups and individuals, began to develop priority issues and long-term goals. Activity in the sustainability domain was distributed among a number of staff units, including Manufacturing, Research & Development, Human Resources, Communications, and Legal. Data collection focused on these and other units at the headquarters location, where we could observe structuring processes at the corporate level.

The case of Alpha allows us to generate theoretical insights about the process by which new issue domains become structured. Sustainability is a broad, ambiguous domain that entails several sub-issues, from climate change mitigation to waste reduction and social inclusion. Contributing to sustainability has become an objective that organizations often embrace, yet for which limited guidance exists on exactly what to do or how to prioritize multiple issues (Risi and Wickert, 2017). Most corporate sustainability activities are discretionary, and often companies encounter many more options for sustainability contributions than they pursue. Even when a corporation accepts a broader mandate to contribute to sustainability, its particular programs and policies are still emergent in that they are not predetermined by external demands or internal constraints. Thus the case of sustainability at Alpha is most representative of organizational change around issues that are new, broad, and not enshrined in preexisting structures.

Data

The main data collection occurred between January 2008 and June 2009, with repeated but more selective follow-ups until June 2010. During this time, we conducted 37 formal interviews with 28 employees, observed 29 meetings, attended a professional conference with Alpha headquarters employees, accompanied Alpha staff on two, three-month consulting projects, collected over 100 internal company documents, and, toward the end, shared preliminary insights with Alpha employees. In addition, we had numerous informal conversations in the course of our fieldwork. Our data collection was designed to generate and triangulate emerging theory, not to yield a representative sample of data points (Locke, 2001). The diversity of sources allowed us to explore the process at different levels of analysis. Observational data were critical for identifying dynamics in interaction situations, interview data allowed us to understand people's experiences and track their changing understandings, and documentary data allowed us to record and map structures and put sequences of situations into temporal and organizational context. We also drew on six interviews with sustainability advocates at other companies to assess the generalizability of our observations at Alpha.

When we started the research, our interest was in how sustainability is understood and pursued by those who promote it in organizations, specifically exploring how people incorporated environmental and economic goals in their work. Our initial research included exploratory interviews and site visits over a two-month period at Alpha and comparison interviews with sustainability leaders at other organizations. The role of interactions around sustainability and their connection to organizational structuring emerged as a theme in this initial phase. It also became clear that Alpha was seeking to organize a broader domain around sustainability but was unsure about what exactly to do. We gained access to study this process for the following year and revised our data collection strategy to encompass interviews, observations, and archival documents around all evolving sustainability issues that Alpha was addressing. A benefit of this evolution of our project is that we started data collection before organizational structuring had occurred and therefore were not at risk of selecting the case based on the dependent variable.

Interviews. Interviews included employees from within SHE, finance, corporate strategy, audit, legal, communications, marketing, supply chain, and product development. The initial sample was drawn via snowball sampling and from weak ties to one of the authors (shared alumni status with a consulting firm). Later, we moved to a theoretical sampling approach to collect repeated interview, observational, and archival data on evolving sustainability issues, designed to map related activity over time and understand connections. Formal interviews lasted 1–1.5 hours and were recorded and transcribed. The interviews covered individuals' roles in Alpha, their understanding of and commitment to sustainability, and recent and general experiences with particular sustainability efforts. We asked interviewees to list and address recent events associated with sustainability efforts, sources of motivation, deflating and energizing experiences, and their understanding of what sustainability entails. We also asked questions designed to clarify and cross-reference subjective experiences of events for which we had observational and archival data. The interviews provided us with insight into respondents' personal experiences, mobilization, and understandings in relation to interactions around sustainability initiatives.²

Observations. The 29 direct observations of interaction episodes ranged from one-hour conference calls to day-long workshops and also included recurrent and ad hoc meetings. Examples are meetings of informal working groups, formal meetings for specific initiatives, consultant presentations, and multi-issue coordination and strategy meetings. Eight meetings were recorded and transcribed. For all observations, both researchers took detailed, descriptive field notes. Initial observations were designed to give us insight into a comprehensive range of issues. Later, we sought out meetings based more on theoretical concerns—specifically, observing more complete sequences of interactions for issues and interactions embedded in more and less formal processes. The observational data provide us with understanding of situational

² Descriptive summaries of the interview and observation data are included in Online Appendix A (<http://journals.sagepub.com/doi/suppl/10.1177/0001839219836670>).

interaction dynamics and, in combination with interviews and archival data, immediate traces of interactions. In addition to these non-participant observations, the second author also advised two, three-month sustainability-related consulting projects by MBA students that were managed by Alpha employees. As a participant observer, we were able to observe all interactions between the consulting team and Alpha employees during data collection and presentations and learned about how this work was used at Alpha.

Archival documents. We collected approximately 100 company documents, such as detailed analysis spreadsheets; meeting minutes; presentations and reports; internal websites and documents detailing tools, templates, and procedures; and e-mail exchanges. These documents provide important information about event timelines, activity outside interactions, and formal meeting agendas and outcomes. They also capture many organizational structural changes as traces of interactions, such as requests for proposals (RFPs) or formal committees.

Analytic Procedures

Our analytic approach is best described as analytic abduction (Peirce, 1955; Hanson, 1958), an iteration between empirical data and preexisting theoretical constructs (Snow, Morrill, and Anderson, 2003; Timmermans and Tavory, 2012). Preliminary analyses directed our interest in the relation between situated interactions and organizational structuring and also established an inventory of sustainability issues that people at Alpha engaged with. We define an issue as a set of problems and activities that Alpha's employees saw as connected to a broader issue domain, in this case sustainability.

Next we distinguished several intermediate levels of structure that allowed us to see the unfolding of structuring as a gradual process (vs. using a binary distinction between interaction and structures). Our levels correspond broadly to distinctions articulated by Gonos (1977) and Wiley (1988) in the context of theorizing the relationship between interaction situations and societal structures. The levels start with the level of the situation, where interactional dynamics between participants in that specific place and time dominate, with few external (structural) prescriptions. We termed the second level "provisional" to describe observations in which trans-situational traces, e.g., participants' communication and understandings from situational interactions that precede the interaction, play a more direct role in shaping interactions in a chain-like fashion. The third level, "informal," describes emergent structures that are located in more enduring relationships, routines, and personal habits among participants, so that interactions are more strongly scripted and afford participants less discretion. Yet informal structures still depend on the specific participants and are not replicated if people are replaced. The highest level of structuring in our model is "formal," when personal relationships and routines are replaced with impersonal procedures and role structures (termed "generic subjective" by Wiley, 1988). In this case, behavior in interactions is driven by externalized organizational structures that prescribe behaviors and affect the selection of people into corresponding roles. Table 1 includes definitions and examples of indicators for each level.

Table 1. Structuring across Organizational Levels

Level	Definition	Examples of observable indicators
Situational	Confined to the immediate context of a specific interaction episode [situation = the configuration of people, roles, norms, objects, and place in which a bounded interaction takes place]; situational outcomes of an interaction are not automatically carried forward to other interactions	Changes in momentary emotion (e.g., excitement, frustration), speech acts during interactions, momentary agreement or misunderstanding, shared or divergent attention during or at the end of interactions
Provisional	Trans-situational, but not routinized or formalized; involves prior interaction and consensus to continue on the part of the participating individuals, but also understandings that are temporary rather than durable and no expectations of permanence	Agreements to interact in the future, verbalized shared understandings and attitudes toward issues, shared exploration of issues
Informal	Recurrent and routine, habituated with the expectation of continuity, but discretionary behavior in the sense of not being enshrined in formal organizational structures or procedures and hence dependent on individuals involved and limited in scale/pervasiveness	Pilots, limited-time efforts like projects, interpersonal action networks and working groups, group-culture-level beliefs, norms, behaviors, and goals
Formal	Sanctioned by organizational authority and tied to formal structures, roles, and standards regardless of personal discretion, not dependent on individuals who hold positions; documented and sanctioned by the organization, reproduced through socialization and education of newcomers	Formal positions, standards, procedures, goals, and budgets; incentive systems, behaviors encoded in technologies such as information technology (IT) systems

Using these categories, we classified all activities occurring around each issue across the levels of organizational structure that can be aligned on a continuum from situation to organizational structure: situational, provisional, informal, and formal. We mapped these activities to see sequences and trajectories of structuring by levels over the course of our study, which allowed us to relate situational interactions to emergent structures at various levels. We then used open coding to identify mechanisms that connected the specific dynamics observed in ephemeral interaction situations to provisional, informal, and formal structures within each issue. This analysis stage yielded a set of what we term “trans-situational traces of interactions.” We first coded the traces evident across our data and then went back to the situational interaction data to code for characteristics of quality within interactions. Existing work often assesses the quality of interpersonal interactions either normatively (e.g., Habermas, 1981) or in terms of the collective outcomes of interaction (e.g., Collins, 2004). In line with a symbolic interactionist perspective, we consider interaction quality as the extent to which interactions generate subjective experiences in participants *during* the interaction of the success of the interaction. Focusing on subjective experience in an interaction allows us to analytically separate the quality of interactions from their consequences outside the situation. To reinforce this distinction between interaction quality and experience, we use the terms successful and unsuccessful for characterizing participants’ interaction experiences.

Finally, we consolidated the elements of our analyses, the situational interaction dynamics, the interaction traces as trans-situational mechanisms, and the level of structuring of an issue into a process model of interaction-driven structuring. We validated and refined this model by exploring whether it could account for the pattern of structuring trajectories we observed across issues.

FINDINGS

Structuring of the Sustainability Issue Domain

Alpha's emergent organizational structure around sustainability consisted of eight distinct issues: greening the supply chain, green product development, addressing the base of the pyramid, a waste-to-profit reuse/recycling program, a science community education program, an employee wellness program, carbon management, and energy/resource efficiency. The distinctiveness of those issues is not inherent but was a result of the meaning-making efforts in Alpha to organize the notion of sustainability into actionable initiatives that we observed in our coding of data. For example, some issues, such as employee wellness, expand the notion of sustainability beyond environmental responsibility and toward a more encompassing triple bottom line approach (e.g., integration of environmental, social, and economic goals). Together, these issues can be seen as a de-facto organizational agenda that reflects Alpha's interpretation of and response to sustainability.

The scope and levels of structure for sustainability issues were not static. Instead, the responses were emergent and changed over time. This dynamic process entailed not only initiatives elaborating specific goals and actions but also some initiatives expanding in scope and developing higher-level structures and others diminishing as organizational responses were formulated. Table 2 summarizes the issues and our coding of their level of structure at different times. Online Appendix B includes indicators of these levels of structuring for each issue. We identify the situational interactions among organizational members as the engine behind the structuring of organizational sustainability efforts and the different trajectories of the eight issues summarized in table 2.

Linking Situation to Organization: Trans-situational Traces at Different Levels of Structuring

We coded our data for traces of interpersonal interactions that transcended situational episodes toward emergent organizational structures. We define traces as results of previous interactions that reside outside the interaction situation, for example as changes in the states of participants or the organizational environment. As changes that remain after a situational interaction ends, traces are the mechanisms that transform interaction activity into structure. And trans-situational traces form potential links between interaction situations, which drive the structuring process. In our coding, we found five different types of traces that enshrined sustainability issues at various layers of organizational structure in Alpha: attention, motivation, knowledge, relationships, and resources. Attentional traces describe patterns of cognitive focus on specific issues by organizational members at the individual or collective level. Motivational traces induce people with the desire and persistence to engage with a particular sustainability issue and can reside in individuals or act as

Table 2. Interaction Traces across Levels of Structuring

Type	Situational	Trans-situational Traces		
		Provisional	Informal	Formal
Attention	Definition: shared attention to issue in hand	Definition: shared concerns and expectations of next steps	Definition: group/network-based goals, priorities, and differentiation of issues	Definition: publicly stated organizational priorities and goals
	Illustrations: focused discussion among participants about shared topic, ability to build off each other	Illustrations: agreement on short-term focus of a project; agreement on agenda and timing of next meetings	Illustrations: aligned group priorities and expectations for efforts; use of collective work plans and sub-goals	Illustrations: priorities in organizational report; issue-related organizational goals and metrics
	<i>Examples: focused discussion among participants about water savings; listening to experiences in one plant's water operations and then applying those to another</i>	<i>Examples: agreement to meet again within a month to talk about the options for leasing "greener" fleets</i>	<i>Examples: aligned group priorities for supplier sustainability outreach; collective work plan for developing supplier workshop</i>	<i>Examples: priorities in sustainability report; public commitment to carbon neutral locations</i>
Motivation	Definition: increased emotional energy	Definition: commitment to the issue	Definition: identity, sense of efficacy	Definition: organizational rewards, incentives
	Illustrations: engagement and excitement in meeting	Illustrations: desire to complete follow-up work; excitement about a specific issue	Illustrations: self-image as issue-related professional or advocate, belief that efforts will yield results	Illustrations: performance evaluation items; awards and recognition
	<i>Examples: engagement and excitement in meeting about potential partnership with SHE, supply chain, and NGO</i>	<i>Examples: desire to complete research before next meeting/ excitement about waste-to-profit marketing opportunities</i>	<i>Examples: self-image as a sustainability professional within supply chain; belief that efforts will help plants decrease their environmental footprint</i>	<i>Examples: annual performance measure on wellness program elements adopted at each plant</i>
Knowledge	Definition: understanding of the topic and others' thinking	Definition: recognition of problem and some possible solution approaches	Definition: knowledge-in-practice, shared understanding of the problem structure and approaches for addressing it	Definition: material devices and technologies, codified procedures and standards, training programs
	Illustrations: recognition of different people's needs and concerns (perspective taking); understanding of where there is agreement and open issues	Illustrations: understanding of the specific issue and what it entails; agreement on what needs to be done to achieve next steps	Illustrations: common terminology and stories, recognition of how different skills/ areas work together, boundary objects	Illustrations: certifications, evaluation checklists, tools and standard operating procedures, supporting IT systems

(continued)

Table 2. (continued)

Type	Situational	Trans-situational Traces		
		Provisional	Informal	Formal
	<i>Examples: recognition of needs for safety and environment representatives during lab design meeting</i>	<i>Examples: understanding there is an issue with supplier sustainability and consideration of a few different approaches for addressing this</i>	<i>Examples: calling the SHE expert about environmental product design concerns; understanding base-of-the-pyramid efforts as aligned with new product innovation</i>	<i>Examples: supplier sustainability training program; employee health risk assessment online program</i>
Relationships	Definition: positive evaluation of interaction partners	Definition: trust, desire for repeat or expanded interaction	Definition: working groups and taskforces, networks and coalitions, shared identities	Definition: permanent relationships sanctioned by organizational authority
	Illustrations: sense of common ground, competent communication or exchange	Illustrations: comfort in sharing quality information, knowledge of who else is/should be engaged; recognition of experts	Illustrations: routinized interaction, self-named or temporary groups; sense of solidarity	Illustrations: steering committees, formal meetings at regular intervals
	<i>Examples: positive view of each other between marketing and SHE participants in waste-to-profit meeting</i>	<i>Examples: sharing product development ideas with SHE representative; plant leaders connecting to share employee health program pilot information with each other</i>	<i>Examples: sustainability interest group conference calls; sustainable supply chain team</i>	<i>Examples: sustainability steering committee; community science education annual program</i>
Resources	Definition: ad hoc intention to allocate time and effort to the interaction	Definition: commitment of effort and time to allow continuation	Definition: discretionary effort beyond work role, use of discretionary or general purpose organizational funds and manpower	Definition: organizational roles, dedicated budget, manpower
	Illustrations: openness to continue conversations and consider additional meetings	Illustrations: making time in the calendar, studying up on the issue	Illustrations: one-time budget and people allocations, pilot projects, voluntary after-work efforts	Illustrations: full-time personnel, operating budget
	<i>Examples: R&D scientists noting they'd be open to another meeting about the community science program</i>	<i>Examples: plant operations manager setting up follow-up meetings with SHE experts about resource efficiency options</i>	<i>Examples: pilot of hybrid delivery vehicles in one state; allocation of one-time budget for base-of-the-pyramid project</i>	<i>Examples: supply chain sustainability manager position; employee wellness program annual budget</i>

extrinsic inducements. Knowledge traces describe the understanding, information, and skills that are generated and accessible to those engaging in sustainability issues and include personal and distributed forms, as well as knowledge enshrined in objects. Relationship traces reflect the social connections and networks that exist between people. Lastly, resource traces represent the time, effort, or funding that people have at their disposal to work on sustainability issues.

Table 3 shows each type of trace from interactions aligned across levels of structuring. As traces of interactions, these dimensions were noticeable outside of and across interactions, not within the interactions themselves. The traces connect interactions about specific sustainability issues across time. For

Table 3. Issue Trajectories*

Issue	Goals and Objectives	Level	Trajectory		
			Month 1–6	Month 7–12	Month 13–18
Greening the supply chain	Improve environmental footprint of the supply chain through logistics, sourcing decisions, and supplier relationships	F			
		I			
		P			
		S			
Employee wellness program	Improve employee health and wellness through the launch of a holistic wellness program	F			
		I			
		P			
		S			
Science community education program	Develop a community outreach program to underserved student populations	F			
		I			
		P			
		S			
Carbon management	Decrease the carbon footprint of manufacturing, administrative, and transport activities	F			
		I			
		P			
		S			
Addressing base of the pyramid	Design and develop business model innovations for global low-income communities	F			
		I			
		P			
		S			
Energy/resource efficiency	Decrease the energy and resource use at the plants' buildings	F			
		I			
		P			
		S			
Green product development	Develop sustainable products and maintain a transparent database for recording and managing product components to measure and track progress	F			
		I			
		P			
		S			
Waste-to-profit reuse/recycling program	Develop a program to provide waste streams to another company that can use them as feeds for their own products	F			
		I			
		P			
		S			

* F = Formal; I = Informal; P = Provisional; S = Situational. Shading provides visual coding of structuring levels present in a period.

example, the provisional trace of attention, shared concerns, and expectations for next steps aligned individuals around the same focus for moving toward the following interaction. Importantly, the traces are not general to “sustainability” but are focused on a particular issue or area that was the focus of interaction. The informal trace of knowledge around the base-of-the-pyramid issue, for example, connected this issue with new product innovation in individuals’ shared understandings but did not influence their knowledge of the other sustainability issues. As there is greater organizational structuring around an issue, the traces change from potentially fleeting outcomes of a single situational interaction to more enduring outcomes of sequences of interactions. For example, the approval of the formal role for a supply chain manager embedded enduring resources to work on this issue, rather than provisional resources of employees making time to work on this on an ad hoc basis. The traces summarized in table 3 do not exist in isolation of each other but instead are often co-occurring outcomes of situational interaction processes through which attention, motivation, knowledge, relationships, and/or resources may be jointly generated. Online Appendix B includes a table of examples for each sustainability issue at Alpha. To understand how interactions influence the structuring of organizational responses to sustainability, we start with a deeper exploration of potential outcomes from single situational interactions.

Situational Interaction Processes

Single-situation interaction processes and their immediate traces are the elementary building blocks of the structuring we observed in our work. Micro-mobilization for an issue was aided by the experience of situational interaction processes as successful: shared issue attention, increased emotional energy and confidence, understanding of the issue, positive evaluations of others in the interaction, and intention to allocate time for future interactions (similar to Lawler, 2001, and Collins, 2004). By contrast, interaction processes experienced as unsuccessful often led to frustration, confusion about what the issue encompassed and whether or not it was feasible, and disengagement from the issue.

We illustrate these situational dynamics with two interaction slices, one taken from an interaction ultimately experienced as successful and another from an unsuccessful one. The first interaction slice from a sustainability interest group meeting illustrates how conversational dynamics synchronized participants’ emotional energy, attentional focus, and understanding of the issue, while also increasing their sense of a common ground. Sustainability advocates at Alpha regularly participated in meetings with each other to discuss progress around sustainability. The example below is from one of these meetings. Six participants were on the phone, calling in from locations around the world. Four participants were in a conference room at headquarters. Steve, from one of the product divisions, shared an update about carbon management in the delivery fleet:

Steve: The two hybrids are built. . . . We’re going to be doing kind of a pilot phase for the next 120 to 160 days and we’ll be evaluating miles per gallon, how is the reduction in carbon footprint, and also how they drive and function. They are a little different than the trucks the drivers are currently using but it’s minimal. . . . We’re anticipating all of that to be successful. So we’re pretty excited about that.

Rob: I didn’t know that all that was going on.

Moira: Steve, do you have a program where you're going to be able to measure the impact of the two hybrids? Rob put together a spreadsheet that we use to calculate carbon for our [type of] fleet.

Steve: Hmm, okay.

Moira: And I'd be happy to send that to you. I can send you the spreadsheet and you can look at the formula that Rob has in there. I couldn't begin to explain the formula but it's right there and you can see it.

Steve: I think that would be good because we're still kind of developing some of those metrics. I mean we're basically measuring some of the fuel economies and some of the emissions. I would like to look at that, that'd be great.

Moira: Okay. Great. Alright. And then, some of the other changes that you've been doing . . .

Steve: Um-hmm.

Moira: Are you able to measure the impact of those changes?

Steve: The EPA provides a fairly robust spreadsheet for tracking a lot of that. So we have that. And then we also have the measurements that we're getting from our current onboard computers that can show some reductions.

Each conversational move acknowledged and built on the previous ones, thus fostering shared understandings and attentional focus among the participants. The statements and tone of the participants suggested that motivation and knowledge about the issue increased in the course of the conversation. This situational interaction produced a number of traces that remained after the interaction moment ended: a shared commitment to exchange resources for tracking carbon impact, requests to connect between the different groups about efforts to decrease the carbon footprint, and excitement about the project.

A counter-example illustrates an unsuccessful situational interaction in the context of a facilities planning meeting. Advocates in the SHE group also participated in meetings with facilities and research and design about buildings and operations, promoting a focus on energy efficiency and environmental materials. The following interaction slice was from an 11-person meeting to review design plans for a new research laboratory. Two participants were from SHE, four from facilities, three from R&D, and two from a supplier. The meeting was held in a medium-sized conference room in the facility where the laboratory would be renovated, with all 11 participants initially seated around a table. Proposed drawings for the laboratory redesign were in the center of the table. Kevin, from SHE, was an issue advocate and hoped to ensure the laboratory plans met more stringent energy and materials goals. This interaction slice occurred toward the end of the meeting, as the groups discussed potential air-handling challenges if R&D would want to upgrade equipment in two to three years.

Sean [a supplier]: Duct work would require taking down the ceiling.

Tom [from facilities, asked R&D staff]: How certain are you that you'll need these machines?

Isaac [from facilities]: Is it worth taking down the whole ceiling now because we might need something 5 years from now?

Kate [from facilities]: Is this duplicative work?
[Multiple side conversations occur.]

Tom [calls for attention from everyone and notes his concerns about equipment upgrades]: We'd have to rip up the ceiling. How certain are we about this?
[Brad from R&D starts to propose another option.]

Kevin [from SHE]: We don't want to do that, right Greg?

Greg [from facilities]: Yep.

Kevin: It's not a bad idea Brad, it's just not where we're going.

Greg: What about other spaces that were added? There's an option to turn some storage into work space.

[Multiple side conversations occur.]

Greg: For safety, could we do this? For [specific type of process], I would say no, but on [this type of process] is this where added effort could go? To pay we'd have to mortgage our future.

Kevin: The term "mortgage our future" concerned me. We don't want to keep robbing from one to pay. We may need to re-do the ceiling and go back to management.

Greg: We don't want to build for what we're doing now, but what we'll need in future.

Kevin: So how certain are you of this?

Tom *[interrupts]*: I have some questions about schedule.

Sean: That's why I asked about requirements.

[The meeting again broke into many side discussions, with two looking at drawings, two looking at contracts, two on their phones, and the rest continuing to talk to each other.]

The exchange is characterized by the maintenance of different foci of attention (numerous side conversations throughout the meeting, multiple people stepping away for phone calls and texts, and small groups looking at different papers, contracts, and drawings; different focus on temporal considerations) and by increasingly divergent emotional tones and motivation (frustration of some; divergent prioritization across time, cost, and impact). As conversational moves do not connect with previous statements, participants remain misaligned, and the group becomes increasingly segmented, with different understandings of the issue. In fact, there was a lack of clarity around how the energy and materials issues connected with the redesign. While the interaction was not characterized by overt conflict about the issue, the issue did not advance. The meeting ended without understanding of next steps or priorities among the cost, timing, or environmental impacts of various strategies. Multiple parties reported feeling frustrated. Note that this outcome came about despite similar antecedent conditions (e.g., previous working interactions between meeting participants, allocated budget, approval for redesign) as the previously described interaction concerning the sustainability interest group.

The micro-interactional processes described above were readily observable and often recognized by interviewees. Yet while each successful interaction left trans-situational traces—such as shared concerns and expectations of next steps, commitment to the issue, shared understandings of the issue, interest in repeated interactions, and commitments for additional work—the effects of single interaction situations were incremental. They were not in themselves sufficient for creating substantial change in organizational responses. Instead, sequences of several situational interactions around an issue aggregated to influence organizational level responses.

From Situation to Organizational Structure

We use three of the initiatives summarized in table 2 to show more comprehensively how sequences of interactions influenced organizational responses. The first—greening the supply chain—highlights the predominantly self-

reinforcing effect of interaction sequences around an issue and how that can amplify the organizational response. The second—green product development—highlights how the lack of interaction sequences around an issue can dampen the organizational response. The third—addressing the base of the pyramid—shows how the trajectory of structuring can change.

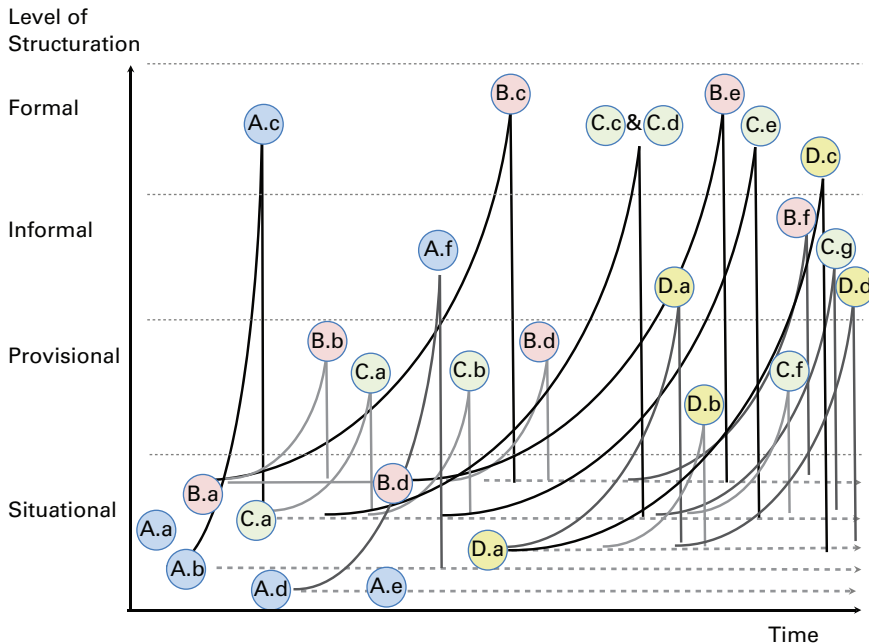
Increasing structuring: Greening the supply chain. The goal of the greening the supply chain issue was to decrease the environmental footprint of Alpha's suppliers. When we began our observations, the supply chain issue had just been included in the sustainability steering committee's list of priorities, yet there had been no operational activity. As shown in table 3, formal structures evolved to address this issue subsequently. Figure 1 shows the sequence of interactions and traces around four areas of issue development: (A) supply chain expertise, (B) supplier engagement, (C) supplier expectations and evaluation, and (D) internal rewards and priorities. We detail the evolution of one of these areas, supply chain expertise, below.

Initially, members of the SHE group held all the supply chain expertise, fully aware that they eventually needed to recruit the participation of purchasing managers and staff. Up until that time, staff in the supply chain unit had rarely communicated with the SHE group, focusing on cost and reliability when negotiating with suppliers. In an early meeting with supply chain, Jackie, a SHE manager, presented environmental issues as having potential to help the buyers meet their primary goal: cost savings (A.a). Light bulbs became a vivid symbol in the purchasing group to show that cost and greening could be compatible when properly analyzed based on a story shared in this meeting. Jackie reflected on this:

I had this light bulb example: Let's say you have three suppliers. Supplier number one [a light bulb] costs \$1 and it lasts two years. Supplier number two has a light bulb that costs \$2 so it's twice as much but it lasts eight years. And supplier number three has a light bulb that costs \$5 but it's 30% more energy efficient and it lasts two years or whatever. And I said, "Which is the better buy for [Alpha]?" And they're all saying what is \$1 versus \$5? So [the purchasing VP], he's in the back and he goes, "Well that depends on the cost of energy or the cost of labor to change it or the cost to dispose." I said, "Exactly!" And then this guy is like "Can you join our team?"

Participants left with positive energy around this issue and understood they could reach out to Jackie in the future. These outcomes of the initial workshop resulted in stronger relationships, and individual supply chain staff later initiated interactions with SHE experts about sustainability (A.b), which in turn led to greater access for members of the SHE unit to regular supply chain group meetings.

As interactions around greening the supply chain increased in frequency over the following months, the managers of the supply chain and SHE units concluded that a dedicated position within supply chain was needed to coordinate activities (A.c). They formed a coalition to present this proposal to upper management and gained executive approval for hiring a sustainability manager in the supply chain unit. This was especially challenging given a general hiring freeze at Alpha due to the economic downturn. The person hired into this position, Moira, had experience in supply chain and brought with her an extensive

Figure 1. Selective illustration: Structuring trajectory of the greening the supply chain issue.

- A. Supply chain expertise
 - a. SHE representative meeting with buyers explaining connections between sustainability goals and purchasing goals.
 - b. Ad hoc advice seeking by plant representatives to SHE about environmental resources.
 - c. Dedicated position within supply chain for sustainability manager posted.
 - d. Supply chain sustainability manager, Moira, was introduced to sustainability staff at SHE and across Alpha.
 - e. Moira held meetings and buyer training programs with procurement staff.
 - f. Sustainability added as focus to annual worldwide meeting of Alpha's supply chain unit.
- B. Supplier engagement
 - a. Meeting between supply chain and SHE leadership to discuss supply chain sustainability goals.
 - b. Agreement on supplier engagement process with top 100 suppliers.
 - c. Launch of regular surveys to top 100 suppliers.
 - d. Partnerships and workshops with 5–10 suppliers.
 - e. Launch of an Environmentally Preferable Purchasing (EPP) Policy.
 - f. Work with core engaged suppliers to develop supplier training seminar.
- C. Supplier expectations and evaluation
 - a. Meetings to determine metrics for evaluation of suppliers based on sustainability footprint.
 - b. Preliminary language for RFP and contract sustainability language.
 - c. RFP sustainability guidelines agreed upon, integrated into general template, and on internet site.
 - d. Service contract sustainability guidelines agreed upon, integrated into general template.
 - e. Supply chain department database of supplier sustainability progress.
 - f. Quick win metrics and reporting tool formatting template.
 - g. Piloting reporting template and metrics with top tier and "ready suppliers."
- D. Internal rewards and priorities
 - a. Integration of sustainability projects into supply chain management priorities.
 - b. Meetings with supply chain and SHE experts to figure out progress indicator metrics.
 - c. Integration of sustainability goals into individual reward structure within supply chain.
 - d. Internal purchasing processes changed to promote sustainable decisions.

network of relationships in the unit through her interactions in her previous positions. She was initially unfamiliar with sustainability and had applied for the job simply because it offered a promotion and visibility with executives. Yet because of the goals and objectives for the position, Moira was quickly introduced to sustainability staff at SHE and across Alpha. She experienced a number of successful interactions with these experts in the first few weeks after starting her new role (A.d).

As initial episodic interactions turned into more embedded relationships, Moira began to count on them not only as a source of timely information but also for greater motivation, a boost of energy, and sense of community. As part of her position, Moira began to organize several meetings with purchasing staff and with suppliers and developed education and training programs. Not least due to her access to sustainability experts, experience in supply chain, and growing personal excitement, these meetings were generally experienced as successful and helped to expand further the coalition within supply chain operations as people came to understand the issue and contributed ideas and effort (A.e). Below is an excerpt from a meeting with Alpha's supply chain employees, a travel supplier, and an environmental non-governmental organization (NGO) engaged with carbon offsets. The meeting started with an overview of the offsets program and presentation of Alpha's travel before the group discussed more specifics of this particular potential project. During this part of the meeting, Alpha employees learned about potential approaches for offsets and considered how that might apply for Alpha. Throughout this situational interaction, participants exhibited a shared focus as they moved from learning more about potential projects to evaluating details of how this might work at Alpha, determining next steps, and scheduling follow-up meetings. The energy of the coalition members was visible in the situational interaction. For example, participants noted, "glad to hear this," "we like the potential," and "we like to be an active part," and they exhibited engaged body language (e.g., sitting at the table and looking toward the speakers, not at computers or phones).

Claire [an Alpha supply chain employee]: I'm glad to hear this from a travel perspective. We're wanting to develop more [in this area].

Will [from Alpha supply chain management]: This team is equally concerned with travel beyond this supplier.

Moira: We're looking for [offset partners] to bring this to us.

Renee [from the NGO]: How much travel does Alpha have with [different suppliers]?

Claire: I need to get a sense of how this is calculated so I can figure this out. We usually focus on cost, and that's what we generally measure. Are these miles numbers based on actual miles or tied to what's paid? Do you get the same distance regardless of how you travel?

Brad [from the supplier]: It's based on miles. We're developing efficiency measures that we could talk about.

Claire: Would it have been better if you had more efficient transportation?

Brad: We're looking at efficiency numbers. They're available if you're interested. The efficiencies are part of what we're trying to do to address our footprint.

Pat [from the NGO]: This has been presented in the context of your travel with [this supplier], but we can also consider your other projects for other offsets.

This situational interaction produced a number of traces: a shared commitment to contribute time and effort to build a baseline of what offsets may be needed,

recognition of some potential issues, and planned meetings to discuss shared concerns over scope. The excitement from this and other meetings around greening the supply chain was recognized as a trace of motivation by others. The vice president of supply chain noted this when he talked about how he decided to add the sustainability issue to an existing channel, the annual world-wide meeting of Alpha's supply chain unit (A.f):

The [Supplier] meeting I did not participate in, but my folks did. And when people come back from a meeting of this topic and run with to-dos going, "I wanna do this," you know. We are going to have [Supplier A] come back and make a guest appearance at our global supply summit of all the leaders from around the globe. Those are things that tell me it's moving in the right direction.

In parallel to the development of supply chain expertise, there were sequences of interactions around supplier engagement and setting expectations and evaluation approaches with suppliers. Many internal to Alpha focused on developing a process for engaging suppliers. This started with meetings between supply chain and SHE leadership to discuss the goals (B.a.). During one of the early meetings the SHE leadership problem-solved with supply chain leadership about the feasibility of more aggressive goals. By focusing on how it might be possible to achieve goals, the two groups worked together to develop more extensive priorities than the supply chain group had initially proposed. Following this meeting, the working group, led by Moira and a SHE representative, developed a supplier engagement process that focused on the top 100 suppliers for Alpha. They decided to prioritize their efforts on those suppliers with whom Alpha spends the most (B.b). To try to build a baseline understanding of what suppliers were doing with respect to sustainability, the group launched a survey to this targeted group of suppliers (B.c) and held brainstorming workshops with five to ten suppliers who were most aligned with sustainability ideas (B.d).

During one of these workshops, the group of SHE and supply chain employees from Alpha and representatives from two suppliers discussed developing a pilot process to develop greater understanding of the sustainability impacts of the partnership. The workshop began with a discussion of scope, in which multiple approaches were suggested, from prioritizing specific suppliers to highlighting one impact area (e.g., energy) to focusing on one component. Throughout the interaction, the participants exhibited shared attention to each area of discussion and increased understanding of the issue and potential strategies they could take. The team decided to first fully understand one component and then engage more suppliers. As they wrapped up the workshop, the group divided responsibilities for gathering more information about the component's value chain and which suppliers connected to it. The same group met again two months later. Across this supplier workshop, participants exhibited a shared focus as they moved from refining scope to considering challenges and developing work plans. Conversational moves acknowledged and built on the previous ones, thus fostering shared understandings and attentional focus among the participants. The comments and tone of the participants, as well as reviews of previous discussions, suggested that motivation and shared understanding about the issue increased over the course of the workshops. The following excerpt is from the second workshop with two from SHE, two from

Alpha's supply chain group, and six who represented a supplier:

Kevin [with supplier]: Let me walk through it to make sure I understand. We have basically [describes the network of suppliers that provide inputs for a specific component and their geographical locations].

Jackie: Right.

Jennifer [with supplier]: What if we look at a local production for this [component]? Because that's such a huge undertaking for the process change if we can look at maybe the freight and see if there's any improvement. My understanding is [one] location is very expensive. But if you actually look at the freight coming from [that location] I think that's a . . .

Kevin: Better way to go to minimize carbon impact.

Jackie: That's why we need you guys because you know this kind of stuff. And it would be good though to talk to [the supplier] at their headquarters you know about this, what we're trying to do. We'll find out what our relationship is with [that supplier].

Kevin: Check also that expense to Alpha.

Jackie: Yeah, I'm with you. And you know, we need to figure out what makes that possible. [Grant at Supplier A] went ahead and did some preliminary estimates on the energy used. And I think what we had decided in our last call was to focus on energy because everybody's looking to knock energy cost down because it's so much.

There was a longer discussion on energy estimates and needs to refine these first analyses further. Toward the end of the meeting, the group discussed next steps and agreed that Grant would reach out to other suppliers first, and Alpha relationship managers would "amplify the request" if there wasn't a fast response.

These situational interactions produced a number of traces: a shared commitment to contribute time and effort to research different steps of the supply chain and other suppliers in the network, goals and priorities for the group, and plans to build and maintain relationships through follow-up meetings. The supply chain and SHE representatives used what they learned about their supply chain during workshops like those above and from the supplier surveys, as well as research on best practices, to develop and launch an environmentally preferable purchasing policy for all buyers to follow (B.e). The working group also continued to engage the select group of suppliers to develop a training seminar for suppliers around sustainability (B.f).

In parallel with the focus on supplier engagement, the working group also considered how they would set expectations for suppliers and evaluate their progress. To do this, they needed to not only learn from suppliers but also partner with the legal department around contracts and the broader supply chain group around requests for proposals (RFPs). Early on there were multiple meetings to determine what metrics could be used to evaluate suppliers (C.a), and this moved toward drafting versions of RFPs and contracts that integrated sustainability ideas (C.b). Eventually the RFP sustainability guidelines were agreed upon within the supply chain group and integrated into the general RFP template that all buyers used (C.c). Soon after, the service contract language was also finalized as part of the standard template (C.d). By integrating the sustainability language into these formal structures, the working group ensured that every buyer and supplier would at a minimum see that sustainability was noted and ideally view this as an area worth continued improvement. As Moira noted,

The RFP template is actually on our Internet site so every time someone does a sourcing project and it requires an RFP then they pull that same document down. So the language is embedded in it now. And if nothing else it will make them think about it and tweak it as applicable for their project that they're working on, you know whether it's a product or a service that they're trying to source.

Further, by adding these sections to standard processes and forms, the supply chain formalized the process for measuring progress and started capturing data for their suppliers that were then fed into a database for continued monitoring (C.e). To bring greater visibility of these metrics to the supply chain group, they built an internal template that reported on quick wins (C.f) and began to pilot this with suppliers as well to get early feedback before a larger scale roll out (C.g).

The metrics and structures enabled more formal internal rewards as well. Initially this was done by integrating sustainability projects into supply chain management priorities so that every supply chain meeting had time dedicated to sustainability on the agenda (D.a). Supply chain leaders struggled with what they felt were "subjective" elements of tracking progress and pushed Moira to develop clear outcomes and key performance indicators. She met with others in supply chain and SHE to develop a clearer set of metrics (D.b). As they worked on this, they realized that a key way buyers became involved with sustainability was through the use of tools such as those for RFPs or contracts that had already been developed. Therefore, when they formalized sustainability goals into individual reward structures in supply chain, they initially focused on rewarding use of those tools (D.c)—"using the RFP language, making sure that there's sustainability language in the contract"—and promoting sustainable decisions for indirect purchases (D.d)—"changed that initial homepage so that it's all their eco-friendly items."

Thus what we witnessed in this issue were sequences of successful situational interactions across many aspects of greening the supply chain that increased attention, motivation, knowledge, relationships, and resources for the issue. As a result, by the end of the study period, there was a greater response within Alpha to this issue across provisional, informal, and formal structures.

Decreasing structuring: Green product development. In contrast to how successful interaction sequences led to greater organizational structuring, the lack of successful interactions around an issue was associated with a lack of formal organizational response. The green product development issue illustrates this pattern. The goal for this issue was to develop sustainable products and reduce the environmental impact of product components. As with the greening the supply chain issue, this became a formal sustainability priority with initially limited operational activity, as well as a new concern to a complex organizational unit. Because of upcoming regulations, this issue was initially expected to move forward quickly, but projects in this area stagnated with no formal structures, as shown in table 3 (above) and figure 2.

Repeated interactions that participants experienced as unsuccessful impeded mobilization around the issue and limited inclusion in decision making. Early on there were signs of potential structuring. SHE leaders had meetings with R&D executives to highlight the potential negative impacts of ignoring

Alpha's pilot product development procedure (PDP), so that product developers were required to interact with the SHE group during the design process (A.c). These meetings were frequently not called until after the product development team had developed an initial design, however, which made it difficult to make modifications and for SHE staff to inform the process.

These meetings produced several situational interactions that left participants frustrated, which in turn prevented the emergence of the strong informal relationships that pave the way for greater structuring. In fact, the PDP pilot was redesigned a few months later, presenting an opportunity to integrate environmental objectives more extensively. Because of the lack of informal relationships and energized issue advocates, however, SHE representatives were consulted only after the design was complete, and the revised process included sustainability concerns only in the form of selective information sharing (A.d). Even after the SHE group reached out to their colleagues who designed the process, the sustainability language was not added back in. When we first started our data collection, SHE representatives felt that the integration of the sustainability checkpoints would occur quickly, after a conversation or two with the R&D PDP design team. Soon after this, however, the groups started working almost exclusively on addressing a regulatory concern. These interactions were fraught with frustration and concern about risk and derailed attention on sustainability checks in the PDP. Over a year later one SHE representative noted (A.g):

I mean it'd be nice to have the changes that we made [added to the product design process] but we're still getting by, still getting phone calls, still intervening. It's not ideal in that we've got more specific deliverables in the [proposed PDP process] and more accountability. It just would give us more leverage. That's all.

Throughout this time SHE representatives did continue to engage with product design teams informally, particularly sharing information on regulatory requirements and safety risks (A.e). They also highlighted the growing customer concerns and interests about products' environmental characteristics, and occasionally SHE was even contacted by marketing asking about the potential of profiting from environmental products (A.f). But these interactions were not occurring in fully connected networks—SHE brokered occasional sustainability-related information requests between marketing and R&D and continued to have relatively siloed engagement with each group.

Advocates in the SHE and regulatory affairs groups also initiated meetings with product development and information technology (IT) staff about developing a database of product materials that would be needed to comply with impending regulations (B.a). An example of these interactions was a four-person meeting. Three participants had met previously about this issue: Andrea, from IT, and Ben and Rob, from SHE, were directors in their respective groups. Chris, an executive in IT, participated for the first time. The meeting was held in a small conference room in the SHE department at headquarters, with all four participants seated around a table. Ben and Rob were issue advocates and hoped to recruit Andrea and Chris to support the case for the database when it was presented to the strategic planning committee.

Chris: In the old Alpha world, if you had the money to do this no one could stop you. But what we're trying to encourage is for you to slow down now so we can go faster later. It will be a mess if everyone goes on their own.

Ben [*in a loud tone*]: Our frustration is that we've been trying to sell this [database project] for years! It's a competitive advantage. We can sell as green products. Customers are asking for this.

Andrea: There should be a compelling business case.

Ben [*speaking more loudly, leaning forward and gesturing with his hand*]: There already is—especially in Europe.

Rob: [*nods*]

Andrea [*calmly*]: I think the biggest challenge isn't getting up the database, but is getting all the data and understanding where it is, what form it's in, and how we bring it over [into the database]. The matter is timing.

The exchange is characterized by the maintenance of different foci of attention (Andrea and Chris are concerned with internal coordination questions, Ben and Rob respond with external opportunities) and by increasingly divergent emotional tones and motivation about the issue (Andrea and Chris are hesitant and factual, Ben and Rob are excited and increasingly frustrated and aggressive). As conversational moves do not connect with previous frames and emotional states, cognitive and emotional orientations remain misaligned, and the group becomes increasingly polarized, with different understandings of the issue. The meeting ended without commitments for further resource allocation of time or people, and all parties reported feeling dissatisfied and frustrated.

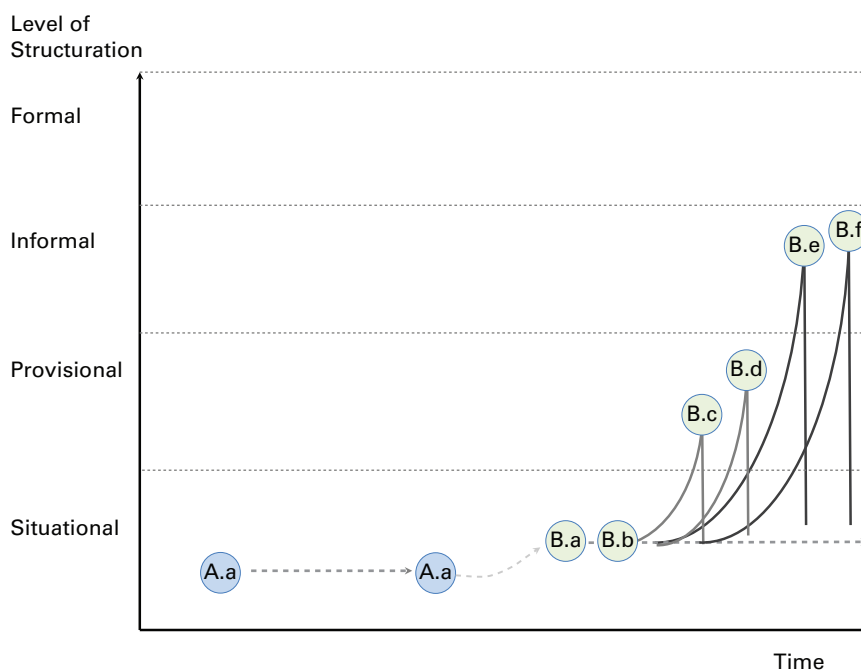
A consequence of these unsuccessful interactions was the inability to form cross-departmental coalitions to obtain additional manpower and budget from corporate management (B.b). As the supply chain issue illustrated, obtaining formal resources can create a reinforcing feedback effect. We observed the same feedback effect for the product development issue but in the negative direction: the lack of dedicated staff and budget that resulted from low mobilization made it more difficult to develop realistic solutions in subsequent meetings, leading to frustration and beliefs that sustainability and product innovation were incompatible. Alpha was unable to address key elements of the regulatory requirements, as the system was not in place (B.c). The continued threat of regulatory sanctions led to eventual agreement on a software to purchase; however, the group remained unable to capture the information needed to feed the software analyses (B.d). After a number of unsuccessful interactions, growing frustration in the group was evident, and progress stalled. With the regulatory change looming, the SHE lead was able to convince two executives of the urgency, and they eventually launched a new committee to develop requirements and documentation (B.e) with hopes this could refocus the efforts to complete the database.

Another consequence of unsuccessful interactions was that sustainability advocates began to reallocate their attention to more rewarding issues. We observed seven monthly coordinating meetings of the core sustainability group and had minutes from five additional ones. In the beginning of our observation time, both supply chain and product development were discussed to an equal extent. Over time, however, supply chain was discussed more and product development less. By the end, the time allocated to supply chain conversations had increased by about 50 percent, and the time allocated to product

development had decreased by 50 percent. Furthermore, the discussions that did concern product development focused on frustrations and lack of progress.

Dramatic change in structuring: Serving the base of the pyramid. The two previous cases show the amplifying effect of situational interactions, in which initial outcomes reinforce the issue trajectory at the organizational level, but an issue's trajectory can also change. The base of the pyramid (BOP) issue floundered initially and gained momentum later, as shown in table 3 (above) and figure 3. The goal of this issue was to serve low-income global populations through new products or services. For quite some time there were sporadic discussions about how to proceed with the issue, but little actual activity (A.a). As an example, during this time, Sharon mentioned that she was "sending e-mails to the [executive in business line] to explain the ideas about the access to healthcare and capturing what our opportunities are" so that she could "try to bring some of the business leaders along and educate them what the opportunities are." She suggested these communications were "facilitation, but it's

Figure 3. Selective Illustration: Structuring trajectory of the base-of-the-pyramid issue.



- A. Steering committee priority
 - a. SHE leaders and advocates occasionally discuss BOP ideas during status updates.
- B. BOP pilot development
 - a. BOP workshop with leaders from across the organization, facilitated by external consultant.
 - b. Continued discussions about new approach to BOP that was developed during workshop.
 - c. Growth in working group as more people volunteer to participate.
 - d. Shared understanding of and excitement about new goals for BOP.
 - e. Prioritized list of potential projects, based on business case and feasibility.
 - f. Executive sponsorship and dedicated funding for pilots. Working group to lead.

also trying to like set off a few light bulbs here and there,” and she expressed her hope that “having candid discussions with select business leaders” would help them “get excited about it, even though they’re not quite sure how to change their whole business model.” These occasional communications about BOP continued for over a year. Then, within a three-month period, a cross-divisional working group was launched, three pilot ideas were developed, and a budget was approved. Although the issue had languished at first, its trajectory changed in a BOP workshop with leaders from across the organization (B.a.).

This idea originated from an issue champion within the SHE group and was part of the steering committee’s formal agenda, but Alpha had no prior experience or existing resources dedicated to this approach. The global products and marketing units that had to be mobilized were skeptical and lacked knowledge about BOP approaches. After the first 12 months, the only tangible outcome of conversations and presentations to higher managers in these groups was the reluctant agreement to hold an informational workshop (B.a) to explore whether and how Alpha should engage with this issue. This workshop was initiated by the SHE representative on Alpha’s sustainability steering committee and attended by employees from Alpha’s primary business units, as well as the corporate SHE, communications, finance, and legal departments. The participants had not interacted as a group before. The official objective of the meeting was to provide background information on BOP development, determine goals, and decide on future work. Eleven participants were seated in a circle around a table in a conference room of the executive area of corporate headquarters, and four additional people participated via conference call.

The following slice is an interaction among five of the participants that occurred in the first hour of the meeting. Dan, the formal executive sponsor for this project from one of the business units, and Erin, an executive in finance, were initially skeptical of investments around BOP and preferred a conservative approach, while Frank and George, executives in SHE, and Hillary, an executive in communications, saw themselves as issue advocates and sought decisive commitments. Prior to this interaction slice, the meeting facilitator, an external consultant, had presented an overview of BOP projects that other companies had implemented. The conversation then revolved around what Alpha might do. Dan restated his concerns about getting senior management support:

Dan: I’m trying to imagine our discussion with senior management. Erin and I were talking about this, and it will be a harder sell. We want to spend and develop. And the question will be, “Tell me more about this. What’s in it for me? What will my returns be?”

Erin: We look at R&D as an investment that we need a return on. How do you do that BOP development as a publicly held company?

Frank: What you want is a new business. And you have a 3- to 4-year horizon. And you want it to grow. And you don’t need \$5 million to do it.

George: Yeah, the seed money can be small.

Erin: *[nods slowly]*

Hillary *[leaning forward]:* I also wouldn’t underestimate the power something like this would have to inspire. If this tugged at heartstrings I wouldn’t underestimate the power of doing well by doing good.

Dan *[also leaning forward]:* Yes, [Our CEO] is absolutely supportive. But making it real, putting a solid plan together. That’s what we have to do.

[The other meeting participants also lean in, nod, and make approving noises, such as "Um hm."]

Dan and Erin's attentional focus is on financial returns and justifying expenditures to senior management. Frank and George's comments maintain this focus but shift by pointing out advantages. Dan affirms this new focus and proposes a synthesis of the two. Each conversational move acknowledged and built on the previous ones, thus fostering shared understandings and attentional focus among the participants. The body language and tone of the participants suggested that motivation around the issue increased in the course of the conversation. The participants continued to learn about BOP and build knowledge about how Alpha may engage in this area. Throughout this situational interaction, participants exhibited a shared focus as they moved from learning about BOP to discussing details of how this might work at Alpha. As the meeting came to a close, participants of the workshop nudged Dan toward committing more time resources:

Irene: Is this a continuing group?

Dan: Well, we'd have to figure that out. . . .

Irene: It would be great to have a group of people to continue this.

[Others nodding]

Dan *[slowly]*: That's a great idea. *[Pause]* I'll commit to that.

Jack: It *would* be interesting to have continued conversations.

Dan: We'll start our own BOP working group then.

The participants then discussed potential items for the now-expected future meetings before concluding the workshop. This situational interaction produced a number of traces: a shared commitment to contribute resources to identify small-scale pilot projects that could create initial successes for the BOP issue, requests to build and maintain relationships through regular progress meetings, and a cheerful and optimistic tone. People within the groups continued to meet and develop plans around BOP (B.b). Dan noted he received "a flood of e-mails, phone calls, people wanting to participate," and provisional resources for BOP (B.c). Dan showed provisional traces of motivation and knowledge (B.d) a few weeks after the meeting when he noted,

My thinking has kind of evolved to be honest. I'm very interested and excited about this, but I'm a neophyte. Right? My view changed quite a bit after our workshop. I guess my thinking maybe six months ago was look, okay, we wanna just really focus on what are our existing products that we have right now that we can move into BOP regions in a relatively pain-free way. Now I want to take two or three really specific ideas that we have and translate those into a concrete business plan that we can execute on. And you know there are ideas we're already discussing.

A cross-functional team led by Dan, Frank, and Sharon worked to develop more specific business plans around a number of ideas, prioritizing them by importance to Alpha (B.e). After iterating on the plans, they developed a specific proposal around BOP that they brought to different leaders throughout Alpha for buy-in before kicking off a pilot. The working group obtained executive sponsorship, a reporting relationship with top management, and dedicated funding for a set of pilot projects (B.f).

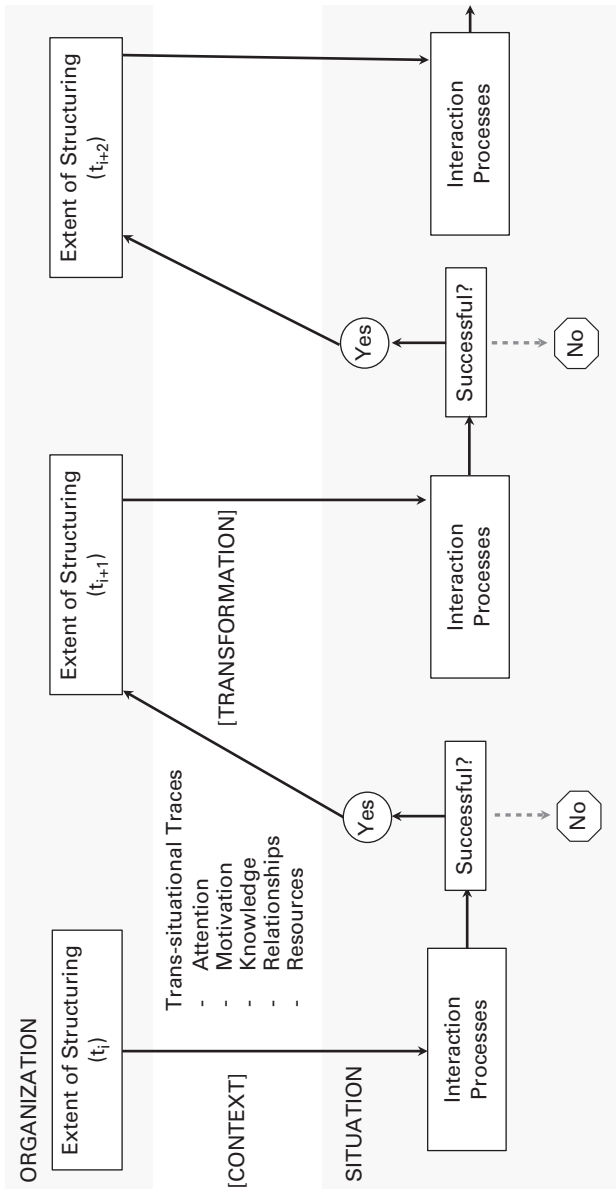
Resulting Process Model

In abstracting from the dynamics and trajectories of the issues we observed at Alpha, we developed a model of the organizational structuring of new issue domains through interaction, presented in figure 4. The figure resembles the basic outline of structuration models but expands on the importance of situational interaction processes and their quality as the origin of changes, and on trans-situational traces as mechanisms that transform situational into structural outcomes.

Figure 4 describes the interplay between interactions at the situational level of analysis, shown at the bottom of figure 4, and the extent of structuring at the organizational level of analysis, shown at the top of figure 4. Interaction situations may vary in their quality, as subjectively experienced by participants as interaction success within the situation. Successful situational interactions are characterized by shared attention, increased emotional energy, understanding of the topic, positive evaluation of interaction, and intention to allocate time and effort to the issue. As figure 4 illustrates, only successful interactions produce the multiple traces of attention, motivation, knowledge, relationships, and resources that transform immediate experience in situations into structures that persist and reside outside the interaction situation in individuals, artifacts, formal policies, and relational structures. In contrast, unsuccessful interactions do not generate these interactional traces. This is an important addition of our model to existing structuration models that either do not distinguish interaction quality or attribute interaction success to non-situational factors. It also goes beyond open-polity work on mobilization that emphasizes interaction opportunities over interaction quality. Trans-situational traces generated in successful interactions translate fleeting experiences confined in the situation into qualitatively different structures at the level of organization, be they provisional, informal, or formal. In this sense, traces resemble transformational mechanisms (Hedstrom and Swedberg, 1998) that translate inputs from the micro level of the situational interaction into outcomes at a distinct organizational level. The model includes a feedback loop, in that the extent of structuring from previously generated traces provides the context for subsequent interactions, though these structures do not predetermine interaction quality or success.

The recurrent nature of this basic model gives rise to temporal dynamics of structuring that account for the observed variation between issue trajectories in our empirical study. Since traces are generated gradually over the course of interaction sequences, the progress of structuration of an issue hinges not only on the frequency of interaction situations but also on their experienced success. It is important to bear in mind that we derived this model from the case context of a new issue domain, the mandate for sustainability. Initially, the extent of existing structuring for new issue domains is very low, so that contextual influences on interaction processes shown in figure 4 are minimal and situational dynamics are central. As this dynamic cycle of successful interactions and their traces gives rise to extended sequences of interactions around an issue, the issue becomes more structured, amounting to more reliable and enduring organizational responses. This process proceeds more quickly if interactions are experienced as successful and, as a result, also occur more frequently. The feedback effect of traces on interaction situations means that structuring increases the probability of further interactions taking place by

Figure 4. Process model of interaction-driven structuring.











providing an organizational infrastructure and also increases the chance of successful interaction around an issue. Yet we also found that structuration is not irreversible and can slow or stall due to unsuccessful interactions, even if interactions do continue to occur. When interactions are not experienced as successful, and trans-situational traces are not generated, structuring stagnates. The less-structured context decreases the probability of future interactions around an issue. The model thus summarizes how divergent issue trajectories arise from variations in the quality of interactions that become amplified through the same process.

Alternative Explanations and Moderators

We considered several alternative explanations to interactional dynamics for the trajectories that we observed, including variation in the social skill of primary issue advocates, top management support, external pressures, existence of a clear business case, and prior organizational commitments. The common characteristic of those alternatives is that they are contextual rather than emergent in interaction situations. Table 4 shows the structuring trajectory for each issue and a coding of the respective conditions along the organizational and

Table 4. Issue Trajectories and Alternative Explanations*

Issue	Trajectory over time	Primary issue advocate	Top management sponsorship	External pressure	Prior organization engagement	Business case
Greening the supply chain		B, C	M/H	L/M	M	L
Employee wellness program		F	M/H	L/M	M	M
Science community education program		E	H	L	L	L
Carbon management		B	M/H	M	L/M	L
Addressing base of the pyramid		B	M	L	L	L
Energy/resource efficiency		A, D	M/H	M	M	H
Green product development		A, G	M/H	H	M	M
Waste-to-profit reuse/recycling program		D	M	L	L/M	H

* Each letter for the “Primary issue advocate” column reflects a unique individual within Alpha. For the other columns, L = Low, M = Medium, H = High.

institutional factors we considered as alternative explanations. If an alternative explanation did override the interactional account developed in our model, we would expect a clear alignment between the conditions of the trajectories for each issue. We found that none of these alternatives alone can explain Alpha's emerging organizational structures in the sustainability domain.

One may wonder if the trajectories of issues' streams can be attributed to individual differences in social skill (Fligstein, 2001) between those championing different issues. A specific issue advocate who had a special ability for motivating and persuading others would be able to sell *any* issue to management that aligns with organizational values (Bansal, 2003). Yet we found that individuals who were successful advocates for one issue failed in promoting another issue (table 4, column "Primary issue advocate"), and some issues progressed faster than others. Based on our model, we suggest that differences in interaction quality over time pull people toward more rewarding issues, and then this choice is reinforced by traces connected to that issue. Thus different issue trajectories may arise due to within-person choices of what to do rather than due to between-person differences in leadership or advocacy.

Arguably, our model also downplays the importance of executive leadership. Holders of formal authority and issue jurisdiction can, of course, influence interactions by focusing attention and energy in line with their objectives (Hambrick and Finkelstein, 1987; Briscoe, Chin, and Hambrick, 2014), although we observed in our study that top executives lacked the fine-grained knowledge to identify specific sustainability issues. The CEO, for example, was publicly supportive of sustainability but unspecific in terms of particular issues and projects. Top management support was essentially invariant for the issues we observed and hence may factor into Alpha's overall sustainability efforts, but it cannot explain the variation in structuring between issues (table 4, column "Top management sponsorship"). When making choices, the CEO and other senior executives largely relied on the choice set of concrete initiatives and proposals developed by mid-level experts and advocates. This situation is likely common for new and ambiguous issues, such as sustainability, for which expertise is not widely shared and expert jurisdictions are ill defined (similarly, see Dobbin and Kelly, 2007).

Another possible alternative is that particular sustainability issues gained prominence because of external influences (Marquis, Glynn, and Davis, 2007; King and Pearce, 2010; Zhang and Luo, 2013). In this view, organizations adopt those practices that are important to outside stakeholders or that are commonly expected due to institutional or market pressures. Table 4 (column "External pressure") suggests that the extent of external pressure alone cannot fully account for the differences in issue trajectories. Even in the case of regulations such as the use of toxic materials in product development, the interaction processes influenced the extent of structuring. Since we studied a for-profit organization, one may also wonder if issue priorities were determined by economic benefits—if issues that promised the greatest return on investment would gain in prominence due to their strong alignment with organizational profitability values (Bansal, 2003), while those that did not faltered. We also did not see this trend (table 4, column "Business case").

This does not mean, of course, that these factors do not matter for structuring organizational sustainability efforts, but none of these explanations a priori determines the varying trajectories. Interaction dynamics play an independent

role and cannot be reduced to contextual influence. We also suggest that many contextual explanations are processed through interactions inside of Alpha, and how they are represented and used in interaction affects their actual influence. On one hand, the clear financial business case for a waste-to-profit program was questioned on some of its assumptions and neutralized in a meeting through concerns about the alignment with other business processes. On the other hand, financial returns were barely addressed in discussions of the science community education program. The alternative factors identified above often surfaced as symbolic resources in interactions to lend authority to arguments. For example, advocates would evoke CEO support for sustainability when recruiting allies for issues like base of the pyramid or employee health projects. But the CEO's preferences or the salience of issues in the public or the business cases had to be made sense of and agreed upon through interactions within Alpha. It is possible in principle that Alpha represents a unique case in this regard. Yet even though our study focuses on a single case, the case is likely to be representative of the current state of sustainability in many companies and how organizations deal with similarly emerging and ambiguous concerns.

DISCUSSION

Our study suggests that situational qualities of recurrent interactions shape the formal and informal structures that organizations develop in a new issue domain. Interactions generate trans-situational traces—changes in attention, motivation, knowledge, relationships, and resources that reside in people, technologies, and other structures—and these traces accumulate in the course of interaction sequences. The experienced success of interaction episodes directs traces toward some issues and away from others. Interactions thus both animate and direct structuration and mobilization processes that enshrine some issues more than others in organizational structures.

Theoretical Contributions

The emergence of organizational structure. This study advances contemporary research on the emergence of organizational structures from distributed processes. It unpacks the notion of “emergence” that is often used as a shorthand for the organizational consequences of interpersonal interactions in structuration as well as political process research. While existing work acknowledges that structuring results from interactions that involve gradual practice adjustments (e.g., Orlikowski, 1996) or the mobilization of advocacy coalitions (Weber and Waeger, 2017), it affirms the outcome of interactions more than it explains the processes through which these outcomes are generated.

We identified several types of trans-situational traces that are generated within the analytic unit of the interaction situation: attention, motivation, knowledge, relationships, and resources. The notion of traces preserves the fleeting nature of situational experiences but also shows their role in animating emergence through repeated nudges that modify attention, motivation, knowledge, relationships, and resources at the level of people, objects, task routines, or

policies. The structuring of organizational action thus resembles a process of sedimentation in which structures emerge from an accumulation of interaction traces. While the basic idea of interaction traces resembles other interactionist work—for example in Collins' (2004) model of interaction ritual chains, Weick's (1995) depiction of sensemaking as ongoing process, or Leonardi's (2011) notion of imbrication between human and material agencies—this work generally does not map out the gradual accumulation of traces and the forms they take across different levels of structure. By contrast, our model shows the presence of each type of trace at provisional, informal, and formal levels of structuring. For example, we see motivational traces in the formal incentive systems, emerging identities, and people's provisional desire to engage around an issue. The structuring of an issue domain need not be equivalent to formalization.

These traces of interaction situations correspond to dimensions of organizations that have been studied in existing research, yet very little of this work has examined the processes that connect situational dynamics with the emergence or non-emergence of organizational structures. We thus see the contribution of this study not in the discovery of these dimensions but in a systematic and detailed exploration of when and why interactional processes animate or prevent the generation of traces at different levels of structuring. In addition, we show the pervasive role of interactional dynamics in affecting multiple traces at once. For example, though Ocasio (1997) discussed the general role of attention structures for organizational outcomes, and the importance of interaction situations is central to the garbage can model of decision making (Cohen, March, and Olsen, 1972), these works do not systematically theorize the gradual structuring of attention over consecutive interaction situations or acknowledge the role of interaction quality within situations.

Contributions to structuration research. By showing how interaction situations influence the selective emergence of structures in an issue domain, we address the question in structuration-based research of what propels structuration forward. We see analytical advantages in the proposition that the quality of interpersonal interactions within situations animates the process. Existing work often implicitly assumes that structuration is ongoing in the course of human activity (e.g., Barley and Tolbert, 1997) or suggests a natural path toward greater structuring (e.g., Leibel, Hallett, and Bechky, 2018). While structuration is by definition ongoing (Giddens, 1984), organizational researchers are more often interested in the incorporation of particular issues into structures rather than integrating interactions with institutional emergence at the field level (Leibel, Hallett, and Bechky, 2018).

Our model goes beyond the treatment of interpersonal interactions in existing structuration research. Starting with Barley's (1986, 1990) work, structuration research initially focused on new technologies as a trigger for the gradual reconfiguration of roles and interaction networks (what we describe as part of informal structure in this study). This process of gradual adjustments produces changes not only in relational structures but also in organizational norms, policies, hierarchies, and policies (Orlikowski, 1996). This line of research was extended by Leonardi (2007), who showed that networks change not only by the disruption of new technologies but also through the use of material

features of information technologies that shape the information available in the adjustment process, and by Perlow, Gittel, and Katz (2004), who showed that the growing alignment of interaction patterns and reward structures is conditioned by the organization's institutional context. In many studies, interaction patterns are the outcome of structuration, with a less well-specified model of how interactions advance structuration. Our findings extend this work in two ways. First, existing research mostly casts the role of interaction as simply the site of interpretation and information processing that leads to improvised action. In contrast, the concept of interaction traces as transformation mechanisms points to a continuum between the dimensions of experiencing situational dynamics and the dimensions of organizational structure. For example, an experience of emotional alignment while interacting can translate into a sense of similarity and motivation to engage in subsequent interactions and thus contribute to forming relational and commitment structures that externalize motivation in the form of incentives.

Second, emphasizing the analytic unit of the interaction situation introduces an independent source of variation in the structuration of organizational activity, distinct from factors such as actor identities and institutional-cultural factors that would suggest alignment and reinforcement of existing structures. Organizations often face a plethora of possible issues with a large set of solutions. From this arises the question of the relative extent of structuration—how and when some issues become transformed from a purely situational existence into organizational structure and others not. Structuration work does not offer a strong explanation for what directs structuring between multiple possible foci. Our model offers an explanation in the dynamics of situational interaction, which result in path-dependent trajectories of emergent structures for different issues. This move allowed us to develop an account for when issue-level structuration can accelerate, stall, fail, or reverse at various levels and hence why some issues formalize and others not. Our model suggests that organizations have a limited capacity for structural change, such that enshrining one issue may come at the expense of another. Thus interaction situations act as a “switchman” of structuration between issues.

Contributions to polity research. The study also contributes to the political perspective of organizational change by showing how the formal structures and individual interests that are at the heart of advocacy-based models of organizations (Zald, Morrill, and Rao, 2005; Weber and Waeger, 2017) are themselves altered in the course of interactions. Our study thus adds nuance to research on the role of internal activists, issue sellers, and tempered radicals who promote concerns associated with societal change inside organizations (Meyerson and Scully, 1995; Dutton, Ashford, and O'Neill, 2001; Bansal, 2003; Briscoe and Gupta, 2016). Such issue advocates are often portrayed as principled individuals, driven by external identities, and with preexisting commitments to certain causes. Some sustainability advocates at Alpha followed this model and drew motivation from environmental and community identities and from master frames associated with environmental and social justice movements, but we also found advocates' motivations and identities to be more fluid and contextual than often assumed. Over the course of our fieldwork, we saw professional managers with little commitment to sustainability develop

environmentalist identities and self-identified activists lose passion and motivation. The key role of repeated workplace interactions in these processes points to the importance of factors that facilitate frequent positive interactions, such as conversational practices (Goodwin and Heritage, 1990) and organizational free spaces (Kellogg, 2009; Rao and Dutta, 2012; Heinze and Weber, 2015) for action mobilization.

Interactions help develop those who become issue advocates, even without the prior personal identities that have been shown to give rise to issue sellers (Bansal, 2003). Interaction-level dynamics also maintain the efforts of leading advocates in the face of skepticism and resistance to their initiatives, and they expand coalitions and informal networks around issues. What is more, sustainability advocates also implicitly prioritized issues that delivered the greatest gains in quality interactions. We frequently saw alignment between individual interests and organizational values, conditions that Bansal (2003) suggested are necessary for organizational responses. Our work suggests, however, that with limited time and resources, situational interactions and their traces drive issue sellers' continued focus on some issues over others. Importantly, we found that supportive interaction networks outside the organization were insufficient to sustain a high level of effort without supportive workplace-based interactions.

Contributions to corporate sustainability research. Our study also speaks to research on corporate sustainability. Previous research has focused on the substantive question of why corporations' efforts to advance social and environmental sustainability differ, oftentimes even among organizations with very similar business models, strategies, and stakeholders. In contrast to research that has largely focused on external pressures for engaging in sustainability, such as the institutionalization of corporate responsibility (Hoffman, 1999; Delmas and Toffel, 2004; Campbell, 2007; Dahlmann and Brammer, 2011) or regulation and stakeholder pressure (Scherer and Palazzo, 2007; Matten and Moon, 2008), our work focuses on the internal processes through which organizations address social and environmental sustainability. Thus we contribute to a growing literature that attends to what happens inside an organization when addressing sustainability pressures (Briscoe, Gupta, and Anner, 2015; Aguinis and Glavas, 2017; Hafenbrädl and Waeger, 2017; Risi and Wickert, 2017). Building on the recognition of middle managers as important actors for pushing for sustainability initiatives from the bottom up (Wickert and de Bakker, 2016), our work highlights the critical role of interaction processes in forming potential coalitions and formalizing organizational sustainability activities.

Our work adds nuance to strategy research that looks at corporate sustainability from the perspective of the resource-based view of the firm (Hart, 1995; Sharma, 2000), which tends to assume that there is a clear and shared understanding of the organizational capabilities and the decision criteria for prioritizing different issues. We suggest that an organization's response can be understood from a broader strategic view in which internal interaction dynamics influence sensemaking about sustainability. Through situational interactions that involve a broad array of employees across levels and units, capabilities emerging from this process have to be recognized and linked. Organizational actors interpret the external pressures and culture and leverage their capabilities to

make sense of and react to sustainability challenges. This also points to the transition of an issue from being experienced emotionally in less structured situations to being routinized and formalized in organizational structures as one development that corporate sustainability may undergo as it becomes more mainstream and integrated into businesses. Thus addressing sustainability is not only based on well-defined strategic capabilities and field diffusion but is also influenced by organization-specific prioritization processes and the structuring of issue domains that may result in interorganizational variation in emerging structures.

Implications for Future Research

The simplicity of the model in figure 4 inevitably precludes nuances that would make it more general and accurate. Here we consider refinements in light of our empirical material that add accuracy to the model. The first is the role of interactions at different levels of structuring. With increasing structuring, do outcomes of situational interactions become more predictable and less dependent on situational dynamics, so that interactions become less important as issues become enshrined in formal elements of the organization? In the case of Alpha, we saw that existing structures were of limited guidance in the face of a broad new demand and that new structures emerged from the situational dynamics of interactions. Though the timeframe of our study does not allow us to conclusively address the role of interactions in more mature issues, our comparative analysis of issues largely suggests that the role of interactions, rather than their importance, changes at different levels of structure. In the absence of further informal and formal structures, interactional traces such as routines or formal roles act as conduits of reproduction; however, even such formal structures are continually interpreted and enacted in interaction (Feldman and Pentland, 2003; Alexander, 2004). For example, new people taking on organizational roles are socialized to the role through interactions with others based on their previously developed expectations, so that interactions become mechanisms of maintenance as much as of change. We found some evidence of this role in the steady progress of the resource efficiency issue trajectory at Alpha. The role of interactions in reproducing structure also implies that unsuccessful interactions may erode provisional, informal, and formal structures. We saw some evidence of this dynamic in the trajectories of the green product development and waste-to-profit issues, where provisional and informal traces of interactions began to weaken, but did not observe any issue that also eroded highly formalized organizational structures over time. One might expect that interactions could reverse prior structuring in dynamic organizations in which formal structures such as roles or technologically embedded procedures are designed to be broader and more flexible, affording role holders more discretion than in more bureaucratic rule-bound organizations. But more empirical research is needed to assess whether and when the mechanisms we identified could change organizational structures.

For simplicity, our model also ignores possible interdependencies between issues and between different interactional traces. We built our model by comparing the trajectories of several issues and implicitly treated issues as independent. Yet some issues may be more compatible and aligned with each other than others, so that structures generated for one can also be used to advance

another. For example, the carbon management and energy/resource efficiency issues, while distinct efforts during our observations, over time could each use traces generated by the other, for example in the form of informal networks of people involved in materials, water, and energy efficiency also working on reducing carbon emissions in terms of alternative forms of energy generation. Both issues may also involve the same physical plants, equipment, and administrative buildings. In contrast, the carbon management and science education issues are less likely to be compatible. A second source of interdependence between issues are potential multi-purpose coalitions that arise from relationships and interest alignment and support several issues. At Alpha we observed many people involved in the monthly sustainability phone calls working to help each other move various issues forward, such as the person leading the carbon management efforts also helping the sustainable supply chain manager. At the same time, people in this loose coalition were still guided by the outcomes of interactions in directing their efforts between alternative issues, as described above.

Similarly, we identified distinct interactional traces to unpack structuring processes, and implicit in our main model is a simple additive relationship between traces, whereby more of any type is associated with higher levels of structure. Yet traces are intertwined empirically, not least because they are often simultaneously generated in the same interaction. For example, the same situational interaction may generate motivational, knowledge, and relationship traces. We did not examine whether these act as substitutes, such that either motivation or knowledge will suffice, or that motivation is only effective if accompanied by knowledge. In our analysis, we saw that different traces were often produced in concert and reinforced each other, even when some emerged earlier than others. While this pattern supports the importance of interaction situations as engines of structuring overall, it limits our ability to unpack the relationship between different types of traces. Future research could explore the relationships between traces in a more controlled environment, in settings where different traces are naturally generated in more distinct interactions or where one type of trace is of primary importance.


Our case is similar to many other organizational issue domains, such as new technologies or changing societal norms and cultural expectations. Yet other changes in organizational structures may be conditioned by different contexts, and changes in other issue domains may be processed within existing structures, such as well-established regulatory compliance requirements, or may require dislodging existing organizational structures, as would radical institutional changes. Nevertheless, paying attention to the quality of interaction traces is likely to help make sense of why one issue becomes embedded in structure while others fail to generate enduring change.

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Supplemental Material

Supplemental material for this article can be found in the Online Appendix at <http://journals.sagepub.com/doi/suppl/10.1177/0001839219836670>.

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