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Toward an organizational understanding of the transformation needed for sustainable supply chain management: The concepts of force-field and differential efforts

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Abstract

This paper facilitates an in-depth view of the transformation needed for the transition from traditional to sustainable supply chain management (SSCM)—by delineating its elemental aspects. Taking an organizational unit of analysis perspective, this conceptual review seeks to characterize the fundamental nature of complexities inherent in the transformation, and thereby seeks to explicate the elemental nature of organizational efforts responsible for shaping sustainable supply chains. The findings outline intriguing mechanisms for explaining the complex and endless nature of the transformation for organizations. This discourse also involves the proposition of two novel concepts applied in this context: the SSCM Force-field and Differential Efforts in SSCM. While the former represents the intricate interplay between organizational efforts and organizational complexities in absorbing SSCM practices in the supply chain routines of an organization, the latter reflects the value of additional efforts above and beyond what is required in existing supply chain routines, to facilitate the integration of a desired SSCM practice into routines. The findings show how the force-field impedes an organization's progress in SSCM and how differential effort allows an organization to overcome the force-field, extending theoretical frameworks and offering valuable guidance for practicing managers. Overall, the research strengthens the conceptual foundation of SSCM theory by explicating the under-explored aspects involved in an organization's progressive journey toward SSCM. Further, it is a first attempt to outline the organizational implications of the SSCM journey.

Keywords Sustainable supply chain management, Sustainability, Transformation, Complexity, Force-field, Differential efforts, Conceptual review

1. Introduction

With sustainability having become a mainstay in our contemporary business environment, the *transformation* of an organization's traditional supply chain management (SCM) approaches into sustainable supply chain management (SSCM) is a *journey* that has become paramount. However, some organizations have yet to undertake this journey, while others that have started it are underestimating its complexity. This calls for the need to further strengthen the conceptual foundation of SSCM theory, so as to better understand the complex dynamics ingrained in the journey of SSCM (Geissdoerfer et al., 2017; Gold and Schleper, 2017; Markman and Krause, 2016; Pagell and Shevchenko, 2014; Quarshie et al., 2016; Roy et al., 2018b). Within this context, complexity can be defined as the ambiguity encountered in deriving schemata to encapsulate regularities associated with an emerging subject that advocates a paradigm shift (Anderson, 1999). The complexities associated with SSCM have been emphasized by a few select works in the SSCM literature. It was most explicitly called out by Silvestre (2015), who notes that "sustainable supply chains are not a destination, but rather a journey because as supply chains move toward more sustainable practices they go through a complex, dynamic, and evolutionary learning process" (p. 157). Despite this realization, the literature lacks an in-depth understanding of the complex nature associated with the transformation toward SSCM.

The most profound view of complexity in SSCM emerges at the strategic level of the *sustainability logic*, and relates to the complexities associated with the alignment—or at least reconciliation—of an organization's financial and non-financial interests for the furthering of sustainability ideals (Montabon et al., 2016b; Sayed et al., 2017). More specifically, the sustainability logic governs predominantly the strategic orientation of an organization regarding the type (and extent) of environmental and social practices it may want to initiate in its journey towards SSCM (Meckenstock et al., 2016). In addition to complexities inherent to the sustainability logic, complexities can also stem from the imperative of *control*, which recognizes the need of a supply-chain-wide buy-in toward SSCM and the subsequent responsibility of the supply chain leader to institutionalize SSCM practices throughout the supply chain. Additional

complexities in this regard can stem from the imperative to create a circular economy (Geissdoerfer et al., 2017). With control certainly also being at the strategic level, Frostenson and Prenkert (2015) suggest that a supply chain leader might be challenged by the complexities associated with facilitating a supply chain-wide response toward SSCM, owing to non-hierarchical routes of control prevalent in contemporary supply chain structures. Control can however be achieved when the supply chain leader serves as an orchestrator that directs the SSCM agenda with formal and informal governance mechanisms to foster the legitimacy of SSCM throughout the supply chain (Gosling et al., 2017; Tachizawa and Wong, 2015).

In contrast to the strategic level, the operational level associated with complexities in SSCM has been rarely touched upon. An exception is Nair et al. (2016), who delineate how SSCM proliferates operationally in supply chains. Taking a network's perspective, the authors suggest that SSCM practices become operationalized in the supply chain only when its constituent organizations undertake complex organizational adaptations in an integrated fashion aimed at embracing emergent sustainable practices in their operations. However, this viewpoint has rarely been investigated, with extant literature lacking theoretical granularity that can enrich the organization-intrinsic view of complexity in the operationalization of SSCM practices. Only Matos and Hall (2007) resonate with this position by suggesting that the organization-intrinsic adaptation toward SSCM is complex, owing to the emergence of ambiguity associated with the operationalization of sustainability practices.

Therefore, building on this operational emphasis of complexity in SSCM, and to enrich this organization-intrinsic view, we review conceptually the elemental nature of the transformational journey (SSCM transformation, henceforth) from an organizational unit of analysis perspective. Within this view, SSCM transformation considers a sustainable supply chain as a collective set of organizations jointly seeking to maximize the sustainability performance of the supply chain—where every *individual* organization in the chain is responsible for the intrinsic transformation of its traditional supply chain routines toward SSCM. In addition, this organizational unit magnifies the organization-intrinsic view by theorizing about the organizational components, such as policies, processes, and most importantly, the *collective* roles of organizational members. Viewing the SSCM transformation from the perspective of an individual supply chain organization can thus extend fundamental insights surrounding the essence of

organizational complexity and organizational response involved in the operationalization of SSCM. Enriching this viewpoint, we set the scope of this conceptual review to address the following objectives: (a) to explicate the notion of organizational complexity in SSCM from an operational perspective by theorizing about the complex nature of organization-intrinsic transformation involved in the transition from traditional to sustainable supply chains, and (b) to explicate the elemental characteristics of the organizational response essential for dealing with the organizational complexity of SSCM.

We aim to achieve these objectives by first conceptualizing a new concept that we term the 'SSCM Force-field'. This concept is drawn theoretically from the anchor of complexity theory to characterize the operational underpinnings of complexity ingrained in the SSCM transformation from an organizational viewpoint. Further, taking an organizational unit of analysis perspective, the concept is positioned as encapsulating a detailed account of the SSCM transformation by outlining the elemental forces instrumental for the remodeling of a supply chain organization towards SSCM. More specifically, the organizational unit of analysis facilitates access to the intricate mutuality between the efforts of organizational members and the complexities associated with the absorption of SSCM practices within organizational supply chain routines. Thereby, further enriching the perspective of the organizational response, a novel construct of 'Differential Efforts in SSCM' is defined so as to specify the scope of differential organizational efforts involved; it specifically captures the additional effort—above and beyond what is required in existing supply chain routines—to facilitate the likely complex and potentially ambiguous inclusion of SSCM practices.

Overall, with this focus we are able to magnify theoretically what exactly takes place within an organization as it pertains to the transformation of its supply chain routines toward SSCM. In addition, addressing these aspects facilitates a more detailed understanding of the SSCM transformation toward the further strengthening of SSCM theory. To address these conceptual aspects, we structure the course of this conceptual review as follows. The first part of the proposed conceptualization is crafted under the heading 'Characterizing the elemental nature of SSCM transformation form an organizational perspective', wherein we theorize about the fundamental nature of the SSCM transformation phenomena, with the ultimate objective to further introduce and develop the concept of the 'SSCM Force-field'. The second part is

positioned under the heading 'The elemental nature of an organizational SSCM response to nullify organizational complexity in the SSCM transformation', in which we propose the multi-dimensional construct of 'Differential Efforts in SSCM' to characterize the intrinsic nature of organizational efforts required in SSCM. The subsequent section extends a discussion and offers implications for SSCM theory and practice. The last section concludes.

2. Characterizing the elemental nature of SSCM transformation form an organizational perspective

Moving toward SSCM represents a strategic decision of an organization to embrace the emerging reality of competition in the business environment—which emphasizes business practices that promote sustainable development (Formentini and Taticchi, 2016). While the motivations for this strategic decision (for example in terms of environmental triggers and competitive differentiation) are covered in the literature on corporate social responsibility, literature on strategic decision making within supply chain management pinpoints the responsibility of a dominant supply chain entity to lead and institutionalize sustainability as a legitimate agenda throughout the supply chain—on a general level, Tate et al. (2016) draw the parallel to a cockswain in rowing that provides the cadence call and motivation. As such, what is needed from a strategic perspective is a paradigm shift that drives the propagation of SSCM throughout the supply chain, so that it becomes operationally reflected in organizations' sustainable supply chain practices (Fiorino and Bhan, 2016; Formentini and Taticchi, 2016).

The radical scope of shifts needed add a significant level of complexity to the transformational journey toward SSCM. This view of complexity is in line with the perspective of complexity theory, which describes *complexity* as the ambiguity encountered in deriving schemata to encapsulate regularities associated with an emerging subject that advocates a paradigm shift (Anderson, 1999). Forming the core of complexity, ambiguity emerges from (a) the analytical sophistication prevailing in the interpretation of the subject itself, and (b) the range of frontiers to be investigated for proposing compatible configurations to address the emerging subject—which results in an augmented scope of action (Wang and von Tunzelmann, 2000). This view characterizes ambiguity as imparting a non-linearity to the paradigm shift,

indicating that the shift cannot be modeled as a simple / static process composed of standalone succeeding steps, but that both the antecedents and the outcomes of the shift need to encapsulate the inherent dynamic fundamental forces within and outside of the organization (Burnes, 2005; Styhre, 2002).

As such, operationally, subsequent to the strategic role of a supply chain in embracing SSCM, member organizations in the supply chain are expected to demonstrate SSCM compliance. The compliance at the bottom-line can be simply understood as the response of a supply chain organization to implement appropriate SSCM practices that suit its echelon or position in the supply chain (cf. Kähkönen et al., 2018). More specifically, when an organization begins to operationalize and adapt sustainability principles to its existing supply chain routines, it deals with an augmented scope of action and often entirely new circumstances whose solutions are often radical. From an operational decision-making perspective, this implies trade-offs (cf. Byggeth and Hochschorner, 2006; Wu and Pagell, 2011). However, with trade-offs frequently being extreme, they impart the system with ambiguity—and thus substantiate the analytical sophistication associated with the paradigm shift needed for SSCM (cf. Salas-Zapata and Ortiz-Muñoz, 2019). The sophistication can be further understood as a fundamental interruption of the status quo in beliefs due to the radical nature of changes needed, which are primarily related to surpassing the profit-maximizing focus in traditional supply chain management.

Thus, conjunctively with the analytical sophistication, the augmented scope of action in SSCM leads to ambiguity in terms of a lack of clear principles and solutions toward the remodeling of organizational supply chain routines (Matos and Hall, 2007). As such, while the entire expectation is laid upon the extant know-how, which is comprised of existing supply chain routines and practices that are well defined in the economic domain, this know-how is generally challenged in generating efficient solutions for newly formulated supply chain objectives, as is the case in SSCM. Thus, emerging from this ambiguity, the organizational complexity inherent to SSCM transformation can be understood as the fundamental force responsible for the non-linear transition of a traditional supply chain organization toward SSCM.

With this framing, intrinsic elements surrounding SSCM in organizations can be defined (Figure 1). First, from an organizational perspective, *SSCM transformation* can be defined as the transition of an

organization in the supply chain to shift from the traditional way of participating in supply chains toward a more sustainable way. This transformation is triggered by an *Organizational SSCM Response*, whose purpose is to facilitate the integration of sustainability criteria into the existing ways of operating. This may entail the move to a triple-bottom-line (TBL) perspective, which augments the traditional primary focus on the economic bottom line with both an environmental and a social bottom line. The inclusion of sustainability imperatives is typically achieved through the incorporation and application of *Sustainability Oriented Supply Chain Approaches* (SSCM practices) into the supply chain routines of an organization. An opposing force to the organizational SSCM response as part of this transformation is *Organizational Complexity*, which accounts for the ambiguity in an organizational setting to pursue the desired SSCM practices. Taken together, the conflict between the 'Organizational SSCM Response' and 'Organizational Complexity' suggests the presence of a force-field as part of an SSCM transformation *(SSCM Force-field).* We conceptualize this force field as the elemental dynamics at play for and against the changes that need to be made in the course toward SSCM.

It is important to emphasize here again that this force-field imparts the organizational transition path toward SSCM with a *non-linearity*. As such, a successful incorporation of SSCM approaches will not automatically or immediately yield transformed organizational supply chain routines. This notion is echoed by Silvestre (2015), who notes that SSCM progresses in trajectories where intricate efforts are responsible for countering context-specific challenges. Reefke and Sundaram (2018) further elaborate on the finer-grained nature of this trajectory by suggesting its intrinsic components to revolve around the facets of strategizing, experimenting, learning, monitoring, and controlling. This further implies that the flow of transformation could be bi-directional in nature—meaning that any change, if not firmly maintained, could tend to traverse back. In simple terms, with this perspective, an SSCM approach may lose its place in organizational supply chain routines if it is not continuously monitored, adapted, improved and strengthened. Thus, a successful SSCM transformation can be operationally understood as the ability of an organization to permanently accommodate SSCM practices due to associated organizational supply chain routine deeply ingrained in its DNA. Figure 1 encapsulates these elemental aspects of an SSCM transformation. However, in order to delineate the intricate aspects surrounding the non-linear nature of

SSCM, it is essential to analyze the noted force-field in depth. We therefore explicate an organizational view of the SSCM Force-field in the following.

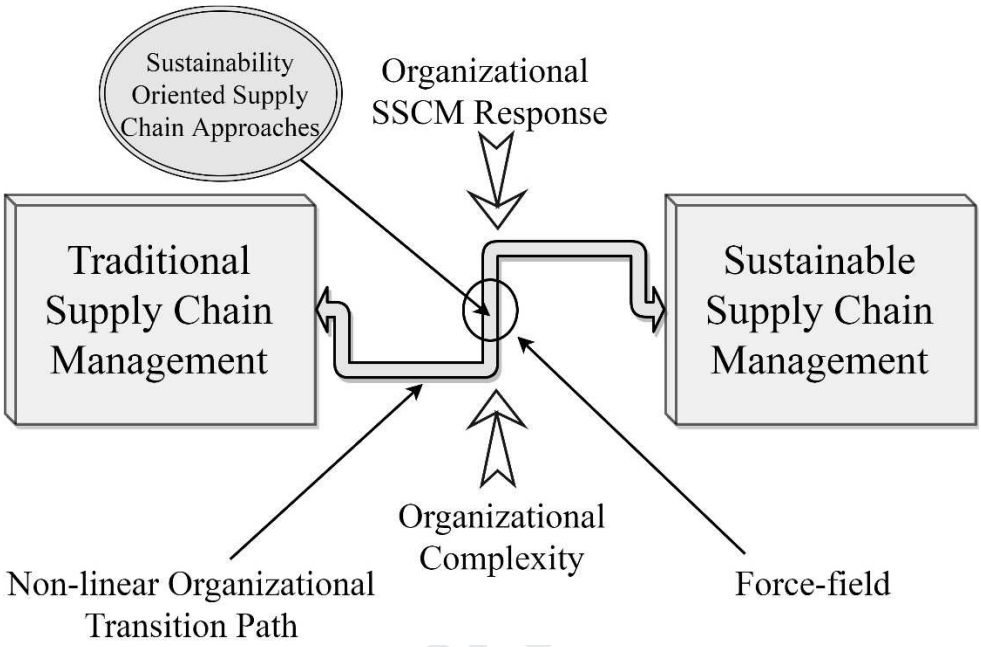

Figure 1 An organizational view of the elemental aspects underlying an SSCM transformation

2.1 Toward an in-depth organizational view of the force-field in SSCM transformation

The 'SSCM Force-field' (referred to as only force-field, henceforth) encapsulates conflicting elemental forces that govern the non-linear transformation of an organization toward SSCM. This conceptualization captures two key forces in this regard, namely the 'Organizational SSCM Response' and 'Organizational Complexity'.

The organizational SSCM response intends to successfully integrate targeted SSCM practices in the supply chain routines of an organization. Supply chain routines in-turn are organizational procedures that reflect the means or processes through which an organization fulfills its obligations toward its membership in a supply chain. For example, the traditional SCM literature outlines several means, such as strategic supplier management, long-term partnership orientation, customer relationships, level / quality of information sharing, and postponement. These approaches, which are essential to be ingrained in the organizational routines of a firm, help companies meet their obligations regarding the maximization of supply chain profits (Li et al., 2006). However, once established, organizational routines are recognized to

result in inertia by limiting the ways of organizational functioning (Ashforth and Fried, 1988; Hannan and Freeman, 1984). Given this inertia, Feldman and Pentland (2003) characterize the transformation of organizational routines to be triggered by crisis situations emerging from areas of ambiguity. Thereby, the authors suggest that transforming organizational routines is heavily dependent on the actions aimed at helping those within the organization embracing the change.

Against this backdrop, the 'Organizational SSCM Response' inherent in the force-field can be characterized as follows. First, it attempts to transform the supply chain routines of an organization by integrating SSCM practices. Second, such a response demands *SSCM Incorporation Efforts* by organizational stakeholders (members, departments) to decode and internalize the *know-how* for the necessary paradigm shift in routines through newer policies, processes, and actions. And third, given the non-linear nature of the SSCM transformation, such efforts need to focus on preventing the risk of SSCM deteriorating back to traditional SCM.

Furthermore, 'Organizational Complexity' forms a conflicting force in the force-field that can oppose the organizational SSCM response. The following key aspects can be noted in this regard. First, organizational complexity indicates ambiguity in supply chain routines generally as soon as 'SSCM Incorporation Efforts' seek to implement SSCM practices. Second, organizational complexity suggests that this ambiguity is in-turn sustained from the lack of know-how in existing supply chain routines—since (a) routines are originally based on traditional SCM protocols and well defined to maximize profits, and (b) SSCM involves significant analytical sophistication and a radical scope of transformation. And third, the lack of know-how leads to the emergence of *inertia* in organizational supply chain routines to halt the progress of SSCM transformation.

Thus, the force-field marks the collision space between an organizational SSCM response and the organizational complexity associated with an SSCM transformation. As such, in order to translate a specific SSCM practice into the supply chain routines of an organization, an SSCM response needs to be formulated based on the know-how that facilitates the mitigation of the noted ambiguity. This know-how can be understood as the *Knowledge Base* derived from the explicit and tacit knowledge codified in the

supply chain routines of an organization (cf. Schoenherr et al., 2014). The knowledge base therefore governs the dynamics within the collision space of the force-field to facilitate a common ground. Further, the strength of this knowledge base determines the extent to which the inertia can be offset to establish targeted SSCM practices as part of supply chain routines. Based on these aspects, and as an extension to the previous graphical representation, Figure 2 presents a magnified view of the force-field to outline its intricate elements.

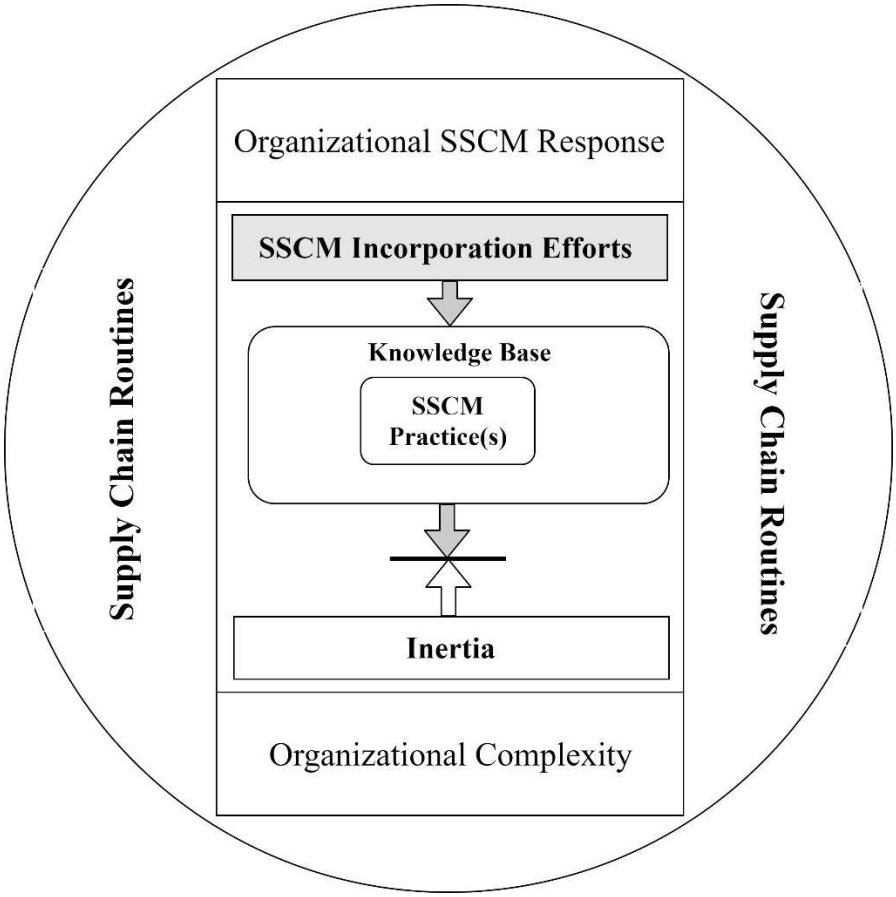

Figure 2 Magnified view of the SSCM Force-field

Figure 2 also reflects the dynamics of the force-field by emphasizing the following aspects. The organizational SSCM response relies on SSCM incorporation efforts, i.e. the efforts of organizational members to propel a desired SSCM practice into supply chain routines. However, 'inertia' deters the inclusion of any desired SSCM practice by impeding the SSCM incorporation efforts. The upward pointing arrow in the figure emphasizes this aspect. On the contrary, to permanently position a desired SSCM practice into the supply chain routines of an organization, it is important to counter this 'inertia' as

soon as possible. In order to achieve this, it is critical to focus the SSCM incorporation efforts toward the enrichment of the *Knowledge Base*. The downward pointing arrows reflect this aspect. Parallels to these notions can be found in the existing SSCM literature, which has started to provide preliminary insight in this regard. For example, the qualitative data in Foerstl et al. (2018) outlines the vitality of efforts toward augmenting 'sustainability know-how' (p. 208) for minimizing SSCM-oriented information uncertainty in purchasing and supply management processes. The qualitative data in Karaosman et al. (2018) reveals similar underpinnings in the context of SSCM-oriented apparel manufacturing / supplier management by highlighting how insufficient knowledge on SSCM can deter sustainability strategies in supply chains.

Overall, these aspects provide an intricate characterization of the dynamic conflict between the organizational SSCM response and organizational complexity by identifying further essential components within the force-field. Thereby, these delineations enrich the explanation regarding the non-linear nature of SSCM transformations. The subsequent discourse further explicates this conflict in greater detail to pinpoint more intricate channels of conflict.

2.2 The finer-grained channels of conflict in the SSCM Force-field

As noted in the above discussion of the SSCM Force-field, while the 'Organizational SSCM Response', on the one hand, is governed by 'SSCM Incorporation Efforts' within the organization to augment the 'Knowledge Base' of supply chain routines in regards to SSCM, the 'Organizational Complexity', on the other hand, characterizes the analytical sophistication surrounding SSCM and the considerable scope of transformation in supply chain routines that has the danger to result in 'Inertia'. Thus, to locate the finer-grained channels of conflict in the force-field, it is essential to analyze the interplay between the SSCM incorporation efforts and inertia in greater detail.

In order to facilitate an in-depth view of SSCM incorporation efforts we need to delve into the detailed process needed for the organizational integration of SSCM approaches. In this regard, Preuss and Walker (2011) suggest that the integration process involves the channeling of ground-level efforts toward the inclusion of sustainability criteria—as well as adaptation by stakeholders toward the novel conditions and challenges posed by such inclusion. We follow their lead in order to explicitly recognize that SSCM

incorporation efforts intrinsically represent a system of simultaneous efforts, first within the organization (organizational efforts—pertaining to both the organizational environment and its members) to embed existing supply chain routines with SSCM principles, and second to drive the adaptation process (adaptation efforts—pertaining to the buy-in towards sustainability at the overall organizational level, the inter-functional level, and the intra-organizational level). However, these efforts are faced with inertia, serving as an opposition against these efforts. Considering these in unison, we focus on identifying these five finer-grained channels of conflict within the force-field (also summarized in Table 1).

2.2.1 Organizational efforts

An organization as part of a supply chain is comprised of the 'organizational environment' and its 'members'. In an SSCM context, the former is essential to strategize and to facilitate the inclusion of sustainability criteria in existing supply chain routines—through the re-shaping of managerial aspects, such as policy decisions, organizational structure, roles, norms, operational routines, performance management, and culture (cf. Andrews, 2010; Knight and Harland, 2005; Wichmann et al., 2015; Wu and Pagell, 2011). The latter represents the collective efforts of organizational members in facilitating SSCM within the organization, which depends upon cognitive aspects, such as skills, information processing, and knowledge—as well as affective aspects, such as motivation, perception, and attitude to shape a collective view (Foerstl et al., 2018; Hult et al., 2004; Pastoriza et al., 2008).

Given the non-linear nature of the transition path inherent in SSCM, continuous efforts toward the re-shaping of the organizational environment is an important response to adapt supply chain routines. Broadly, the re-shaping applies to the formal and informal components of the organizational environment. While the formal component refers to detailed procedures, documented guidelines, and review systems, the informal component involves the creation of the organizational climate in which managers and employees can act in accordance with the values, beliefs, and traditions of the company (cf. Falkenberg and Herremans, 1995; Hosoda and Suzuki, 2015). For example, Bals et al. (2018), within the context of evolving purchasing and supply management priorities under SSCM, outline how facilitating the needed evolution demands an upgrade of supply chain routines in organizations. The authors suggest that the

pathway to this upgrade emerges from the restructuring of critical organizational aspects, such as centralization (the degree of focal power to make supply chain decisions), formalization (the extent to which supply chain processes are governed by formal documents and procedures), specialization (the extent of dependency on specialized departments or skilled personnel), standardization (the degree of tight definitions regarding various supply chain activities), as well as participation (the extent of involvement by organizational members in decision making).

However, the responsibility associated with re-shaping the organizational environment principally falls under the purview of top management within a supply chain organization, without which an organizational SSCM response risks losing its effectiveness (Pagell and Wu, 2009; Yen and Yen, 2012). Given the nature of the shift involved, it is critical for top management to carefully plan, organize, direct, and control the organizational transformation in the wake of SSCM (cf. Li et al., 2018). The actual situation, however, may be much more complex, as evidenced for instance in an interview excerpt included in Preuss and Walker (2011): "Sustainability and environmental issues have not been something that has excited the Members *(top management)* thus far; hence it's been a lower priority issue. It's been an issue for us because it is on the National Procurement Strategy and we want to be seen to be addressing all those things. But locally it's not been a strong political issue for us" (p. 504). This notion can also be found in Kumar and Paraskevas (2018), who focus on characteristics of top management teams that can make the organization more conducive toward SSCM. Key characteristics considered in their study include diversity and SCM-related experience inherent in top management teams.

These perspectives fairly imply the prevalence of reluctance (or unfavorable intension) among top management regarding the uptake of SSCM. This reluctance can be primarily attributed to the challenges that top management already faces while managing diverse activities in order to meet financial targets. Furthermore, this reluctance can be attributed to the aversion regarding the channeling of profound efforts toward organizational transformation. Therefore, being in a setting of status quo interruption, this context can be described as serving as a potential channel for organizational complexity to seep in, ultimately yielding inertia. In these settings, it is critical for top management to take on responsibility for ensuring continuous organizational efforts in re-shaping various components of the organizational environment

toward an SSCM response (cf. Dai et al., 2014; Roh et al., 2016). As such, the *first* channel of conflict between SSCM incorporation efforts and inertia can be located within this space.

The *second* channel of conflict between SSCM incorporation efforts and inertia resides with the members of the organization and their willingness to tackle the challenge of an SSCM response toward the transformation of supply chain routines. Within our context, primarily organizational members at the mid- and lower-levels of the organizational hierarchy have the responsibility to operationalize ground level efforts toward the transformation, while at the same time lacking the positional power to mandate others (Carter and Dresner, 2001; Gattiker et al., 2014; Gattiker and Carter, 2010; Wichmann et al., 2015).

Complexities within this reality are imminent. For example, at a cognitive level, organizational members might not have sufficient information about what sustainability is and thereby end up associating it primarily with environmental issues (cf. Meckenstock et al., 2016). Given the lack of knowledge and needed skills, it may be a significant shift for members to strategize how to practically facilitate the inclusion of sustainability criteria in supply chain operations. Affectively, there might be members who, being inclined toward the topic, readily advocate the agenda and needed efforts. However, there might also be members who are either unaware or unwilling toward engaging in real-time efforts—in the worst cases members may even stigmatize the initiative (cf. Law et al., 2017).

Parallels to these notions can be found in Fayezi et al. (2018), who deliberate on tensions faced by organizational members tasked with SSCM aspects. The authors outline organizational tensions that can be classified into learning tensions (to learn about SSCM and cooperate) and organizing tensions (to channeling real-time efforts). Thus, tensions within the cognitive and affective realms may result in a loss of momentum associated with SSCM efforts within the organization. As such, members might gradually lose interest toward the efforts necessary to avoid the reversal of the transformational progress (cf. Preuss and Walker, 2011). Overall, these perspectives underscore the prevalence of organizational complexity in terms of both analytical sophistication and extended scope of actions surrounding organizational members in the course of SSCM.

2.2.2 Adaptation efforts

Apart from channeling efforts toward the implementation of changes in organizations, it is simultaneously essential to channel efforts for the *adaptation* toward change. Adaptation signifies the transition toward a sustainability orientation on the belief level. Adaptation, which is more than the mere implementation of structures, needs to happen in order for the initiative to be most successful. Taking such a view thus facilitates a magnification and delineation of more detailed actions inherent in an organizational SSCM response. Within our context, adaptation typically applies to different organizational membership settings, such as the overall organizational level, the inter-functional level, and the inter-organizational level (Preuss and Walker, 2011). Adger (2003) suggests that within the context of phenomena that require the masses to adapt to entirely different conditions, adaptation is a dynamic social process. As such, the ability of societies to adapt is determined, in part, by the ability to act collectively.

First, within the *overall organizational context*, the organizational changes required due to SSCM may result in a tension between the values of organizational members in the organization and organizational requirements. The very basic level of adaptation can be expected to happen in small groups within the organization, for example among peers within a function such as procurement, production, or distribution. Group-level adaptation can be expected to provide a psychological shelter to members while efforts are channeled toward organizational requirements (Argyris, 1957). This adaptation indicates efforts toward facilitating a buy-in into sustainability principles at the group level, as well as a subsequent execution of the SSCM response through group decision-making. Therefore, the development of strategy in order to foster a sustainability orientation among peers becomes crucial. What becomes of principal importance here as well is that the audience has to be appealed to in an authoritative manner, especially when considering that sustainability is inherently a “heart and mind” issue. This has direct implications for group formation.

However, changing the ways supply chain processes operate can be impeded by inertia that is driven by risk aversion persisting in the groups and associated with the departure from traditional SCM protocols. For example, procurement professionals may be risk-averse to change the way they work and practice,

especially if current operating procedures seem to do the job. Further, on the group level, complexities can be expected to manifest in the form of group dynamics, which refer to the undercurrents present within and between the groups (cf. Brown, 1988; Stagl, 2007). Manifestations of such may include inter-group differences and non-uniformities in the perceived notion of sustainability (Faber et al., 2005) as well as different expectations of group decision making processes to impede collective action toward SSCM (Adger et al., 2003); these issues can include characteristics such as group composition, leadership, cohesiveness, motivation, goals, and effectiveness of information sharing (Preuss and Walker, 2011). Overall, this represents the *third* channel of conflict between SSCM incorporation efforts and inertia.

Second, the next level of adaptation relates to the *inter-functional level*, at which achieving buy-in toward SSCM is also critical. Given the collective responsibility toward adaptation, departments operating like functional silos are detrimental to the diffusion of a sustainability orientation within the organization. The importance of internal or functional level integration, while adapting and implementing supply chain strategies, is well recognized (Narasimhan and Das, 2001). The supply chain literature primarily discusses such adaptation within the context of a boundary spanning role that functions should fulfill (Pagell and Krause, 2002). Boundary spanning can be simply understood as reaching across margins, sections, or borders in order to facilitate the building of relationships and interdependencies, as well as to foster interconnectedness. A boundary spanning role within the SSCM context, therefore, represents the link between the sustainability orientation in an organizational environment and the various organizational functions. Aldrich and Herker (1977), when discussing an organization's ability to adapt to environmental contingencies, outline two important facets of a boundary spanning role. First, it needs to play an important part in selecting, transmitting, and interpreting the information originating in the environment. Second, it is crucial in shaping the organizational ability to cope with organizational constraints. This suggests that channeling efforts along boundary spanning themes is essential in order to integrate functions toward an SSCM response. This also reflects the importance of boundary spanning agents across departments (cf. Tushman and Scanlan, 1981). These efforts can be broadly associated with cooperation, coordination, trust, and knowledge-sharing at the intra-organizational level—with the objective to facilitate a broader buy-in into sustainability principles.

However, an aspect of inertia lies in the inter-departmental resistance arising from aspects such as the predominance of decentralized structures, the lack of effective communication channels, and a mismatch in competency among departments (Fawcett and Magnan, 2002). As such, the resistance of members becomes instrumental when organizations attempt to achieve radical shifts, where an effective communication between departments represents an important prerequisite to create a positive effect on employees' reactions to organizational transformations (cf. Tang and Gao, 2012). Therefore, from a supply chain perspective, this implies that the lack of internal integration can jeopardize the adaptation of SSCM by organizational stakeholders through a strengthening of the associated inertia (cf. Jacobs et al., 2016; Leire and Mont, 2010). This interface can be recognized as the *fourth* channel of conflict between SSCM incorporation efforts and inertia.

And third, with the purview of supply chain practices typically extending outside of the firm's boundary, facilitating an SSCM response necessarily requires cooperation from other supply chain entities as well. Therefore, sooner or later, an organizational SSCM response has to be extended at the inter-organizational level, i.e. to the other entities of the supply chain. From the perspective of an individual supply chain organization, the efforts here again culminate into facilitating boundary spanning activities outside the organization. Purchasing and logistics, which principally span along external interfaces of the chain, are therefore of central importance (Leppelt et al., 2013). While the importance of efforts broadly remains the same, as outlined in the previous discussion, facilitating inter-organizational adaptation further requires channeling efforts in monitoring, control, and partner development practices toward ensuring compliance and ultimately commitment (cf. Cheng et al., 2008; Foerstl et al., 2015; Grimm et al., 2016; Leire and Mont, 2010; Wilhelm et al., 2016)

However, aspects of inertia may also reside here, namely in the inter-organizational resistance arising from aspects such as a mismatch in the proficiency of SSCM among organizations, challenges in reaching suppliers and sub-suppliers, the effectiveness and enforcement of a regulatory environment, and different regulations in developed versus developing nations, which overall restrict the extension of SSCM at the inter-organizational level (cf. Cheng, 2011; Cheng and Sheu, 2012; Lee, 2008; Tachizawa and Wong, 2014). As such, the qualitative data in Roy et al. (2018a) characterizes this resistance at the buyer-supplier

interface by pinpointing the inertia of suppliers to comply with the buyer's SSCM demands owing to radical shifts in purchasing and supply management protocols. This setting further implies that the lack of external or supply chain integration with partners can be detrimental to the efforts of an organization attempting the journey toward SSCM. Thus, the *fifth* channel of conflict between SSCM incorporation efforts and inertia can be identified as such.

2.2.3 Toward a detailed view of the SSCM Force-field

Having discussed organizational and adaptation efforts, important points can be derived from this conceptualization. An organizational SSCM response at the surface is simply the process of incorporating sustainability criteria through various SSCM approaches. However, at a deeper level it is the process of incorporation (i.e. SSCM incorporation efforts) that determines the force-field of SSCM transformation due to its role in augmenting the knowledge base of supply chain routines. Thus, an organizational SSCM response can be described as a system of simultaneous efforts to effectuate organizational change and adaptation. While the overall organizational component, on the one hand, represents a broad-level view of efforts toward structural changes, the adaptation component, on the other hand, represents a finer-grained view of efforts toward the transformation. Varied complexities along both levels tend to simultaneously negate the transformation efforts. This, in turn, encourages initiatives to simultaneously exert efforts along both fronts toward achieving a reconciliation. The force-field within SSCM transformation, therefore, involves conflicts along multiple channels. These channels (Table 1) can be understood as the fundamental or structural dimensions inherent in the force-field—and are helpful in delineating finer-grained mechanisms for representing the conflict between an organizational SSCM response and associated organizational complexity in the SSCM transformation. The mechanisms also extend a further account of the non-linearity inherent in the path of SSCM.

Table 1 Fundamental channels of conflict within the SSCM Force-field

Channel	Facet of the organizational SSCM response	Facet of the organizational complexity	Key references
Organizational efforts			
First	SSCM incorporation efforts toward the re-shaping of different components of the organizational environment, in order to strategize and facilitate the inclusion of sustainability criteria in organizational supply chain routines.	Inertia emerging from the reluctance of top management to direct and facilitate the re-shaping.	Preuss and Walker (2011); Bals et al. (2018); Kumar and Paraskevas (2018); Gattiker and Carter (2010); Gattiker et al. (2014); Meckenstock et al. (2016); Law et al. (2017); Fayezi et al. (2018)
Second	SSCM incorporation efforts toward the operationalization of ground-level actions by associated organizational members for ensuring the transformation of supply chain routines.	Inertia emerging from the passiveness of organizational members regarding SSCM due to cognitive and affective tensions.	
Adaptation efforts			
Third	SSCM incorporation efforts that reflect finer-grained actions aimed at generating a buy-in toward sustainability in the organization through collectively working in groups.	Inertia emerging from risk aversion toward changes in working patterns and group dynamics that hamper collective action.	Preuss and Walker (2011); Narasimhan and Das (2001); Pagell and Krause (2002); Cheng (2011); Roy (2018a)
Fourth	SSCM incorporation efforts toward generating a boundary spanning sustainability orientation internally so as to integrate internal departments along the SSCM agenda.	Inertia emerging from intra-departmental resistance toward the uptake of radical shifts.	
Fifth	SSCM incorporation efforts toward generating a boundary spanning sustainability orientation externally so as to integrate external supply chain entities along the SSCM agenda.	Inertia emerging from inter-organizational resistance toward the uptake of radical shifts.	

Overall, the SSCM Force-field represents a conflict between the organizational SSCM response and organizational complexity inherent in the SSCM transformation. The organizational SSCM response, therefore, in order to successfully incorporate a specific SSCM approach, requires the nullification of complexities along these fundamental channels. Further, a successful nullification of complexities can be gauged when a desired SSCM practice gets absorbed into normal supply chain routines of an organization. This state further marks an enrichment of the knowledge base inherent in supply chain routines aimed at supporting SSCM. Thus, this provides further clarity about the finer-grained nature of the organizational SSCM response.

Overall, to capture the force-field of SSCM transformation, an 'organizational SSCM response' requires a dual orientation in its 'SSCM incorporation efforts': (i) an orientation to generate new knowledge about SSCM, and (ii) an orientation to develop and nurture organizational efforts to tackle

'organizational complexity' through overcoming 'inertia'. Thus, it is important to understand further the elemental aspects essential for achieving this orientation in the organizational SSCM response—a conceptualization of one such aspect is presented in the next section.

3. The elemental nature of an organizational SSCM response to nullify organizational complexity in the SSCM transformation

The force-field, i.e. the collision space between an organizational SSCM response and the organizational complexity associated with an SSCM transformation, governs the progress toward SSCM. As already noted, it is the knowledge base that determines the collision space and the dynamics of the force-field in the SSCM transformation (referring back to the insights derived in section 2.1). Therefore, to accommodate a specific SSCM practice and integrate it into normal supply chain routines of an organization, an organizational SSCM response needs to be grounded in the enrichment of the knowledge base (explicit and tacit knowledge derived from supply chain routines). As such, the enhancement of knowledge regarding SSCM plays an instrumental role in tackling organizational complexities and guiding incorporation efforts to place SSCM practices in supply chain routines (cf. Boiral, 2002; Lim et al., 2017; Schoenherr et al., 2014; Wu, 2008). Thus, it is important to further understand the finer-grained nature of efforts involved in the SSCM transformation.

To explicate the theoretical aspects in this regard, we further analyze the notion of SSCM transformation in depth through the exemplification of an organizational SSCM response. For example, an organizational response to SSCM within the manufacturing context may initially emphasize operations that minimize waste, also yielding economic gains. Upon a successful absorption within organizational supply chain routines, the transformation path may gradually advance toward the inclusion of more complex SSCM approaches (involving greater status quo interruptions), such as cost reduction efforts through an elimination of waste as part of process improvements, value and volume coordination of wastes, as well as revenue generation through waste. While this pertains mostly to the economic front, a similar progression at the environmental front may include energy savings from more efficient and streamlined processes, the coordination of energy consumption, waste reduction at the source, reduction of hazardous materials use,

conservation of raw materials, the use of alternative energy sources, a shift in focus toward the minimization of emissions, and the adoption of standards. At the social front, practices may entail incentives for a responsible organization as part of an environmental reward system, further sustainability training for instance in more effective waste management, coordination of safety and health compliance and associated costs, initiatives to foster employee well-being, adoption of standards, and societal responsibility (cf. Ciliberti et al., 2008; Rao, 2002).

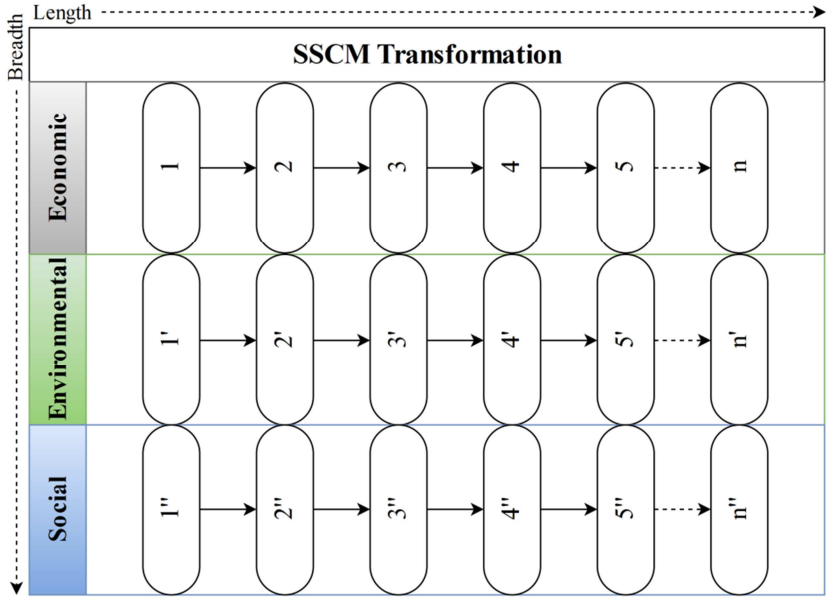

Figure 3 The purview of SSCM transformation

The following example is helpful in outlining the purview of an SSCM transformation in terms of its length and breadth (Figure 3). While length refers to the progression toward the inclusion of more complex approaches within a particular dimension, breadth refers to the progression of the SSCM response along the TBL dimensions. The initial stage of the progression may begin with the incorporation of approaches that entail a minimal status quo interruption (for example 1's and 2's in Figure 3). However, traversing further tends to gradually increase the complexity involved. Therefore, the magnitude of the force-field varies increasingly along the progression. This, in turn, is manifested in the incremental requirements for an organizational SSCM response and the knowledge base required for countering the resultant organizational complexities. This further implies that the vastness of the profile should logically resemble the transition extent needed to traverse from traditional to sustainable supply chains—it should also

resemble the movement of the SSCM transformation toward capturing the deeper essence of sustainability—i.e. toward the equalization of the importance attributed to economic and non-economic supply chain objectives (cf. Shevchenko et al., 2016).

However, with an organizational SSCM response being a system of efforts toward the incorporation of desired SSCM practices (SSCM incorporation efforts), the incremental requirements along the progression can be understood as differential efforts that should further enrich the knowledge base through the creation of new SSCM knowledge. Without differential efforts, the noted progression always risks of facing a halt—i.e. the state of uncontrollability where organizational complexities outweigh the other components of the force-field—and the targeted SSCM practice fails to get absorbed into organizational supply chain routines. These halting phenomena further explain the non-linear nature of an SSCM transformation. An organizational SSCM response, therefore, requires the clearing of progressive halts in the transformation path—by sequentially solving the associated force-fields. It is therefore critical to understand the differential efforts in an organizational SSCM response—a characterization of which is presented in the next section.

3.1 Differential efforts in the SSCM (DES) organizational response

Differential efforts in SSCM (DES) are defined as the additional efforts above and beyond what is required in existing supply chain routines of an organization, in order to facilitate the inclusion of a desired SSCM practice. Without such differential effort, the desired inclusion may not be able to be accomplished. The resulting outcome of DES is a successful incorporation of the desired SSCM approach into normal supply chain routines of an organization. By analyzing the fundamental channels of conflict within the force-field (Table 1), it can be inferred that the facets of ‘organizational efforts’ in a way outline the need for the generation of *intent* toward such efforts—while the facets of ‘adaptation efforts’ indicate the *transition of the intent into action*. Therefore, an organizational SSCM response represents an intrinsic reconciliation process between efforts toward *intent* generation (SSCM incorporation efforts) and efforts toward *action* in an SSCM transformation. Thus, it is essential for the conceptualization to explicate this intrinsic reconciliation orientation in the organizational SSCM response.

The postulated DES requirements lead us to Social Identity Theory (SIT), which outlines the distinction between personal and social identity. According to SIT, group situations are governed by social identity derived from group memberships—which generate a perception of oneness to some human aggregate—and provide a psychological basis for group behavior and outgroup discrimination (Tajfel and Turner, 1986; Turner, 1975). Self-categorization is often viewed as an important explanation for social identity phenomena. Self-categorization denotes a social classification that forms a cognitive basis for group behavior. The specific mechanism includes the formation of group prototypes—which cognitively represent the features that prescribe group attributes. This facilitates a change in self-conceptualization based upon others' perceptions, yielding targets to be now represented as embodiments of the relevant prototype, as opposed to be associated with unique individuals (cf. Hogg and Terry, 2000). Social identification, therefore, refers to the self in terms of social categories and characteristics ascribed from it. It is the mechanism that reflects the group's standing on the self.

In the organizational context, members may follow a categorization based upon different levels: at a personal level with their own career, at a group level as members of work groups, at levels such as units, sub-units or departments, and at a superordinate level, as is the case with the whole organization. Social identification, therefore, can provide a partial definition of the self and help members to derive meaningfulness from the organization. It may further facilitate members to act collectively on behalf of the organization—with a particular focus upon their persistence and collective behaviors (cf. Dick et al., 2004). Therefore, we apply SIT to examine the requirements of DES—particularly by focusing on the potential of identification to act as a primary intent-building mechanism and its influence to govern actions in DES.

3.1.1 Social identification and the supply chain

In their systematic extension of SIT within an organizational context, Ashforth and Mael (1989) define organizational identification as a specific form of social identification—where the organization provides a partial answer to the *who am I* question—and thereby reflects the extent of an individual's identification with an organization. The authors further suggest that organizational identification facilitates integration

between the goals of an organization and the goals of its members. For example, from an individual perspective, the greater the extent of organizational identification in an individual, the more the individual uptakes the organizational perspective and thereby acts in the organization's best interest (cf. Dutton et al., 1994). However, from an organizational unit of analysis perspective, an organization, which resides in the hearts and minds of its members, creates a sense of collective identity among members that serves as a rudder to navigate difficult waters. For example, Reade (2003) outlines how organizational identification contributes to the collective intent of employees of a multinational corporation's (MNC) subsidiary to devote additional efforts for the sake of the MNC as a whole.

Further, extending organizational identification to the supply chain context requires an understanding that the supply chain is a natural business phenomenon to which an organization ultimately culminates. In addition, whether managed or unmanaged, supply chains exist in the normal course of business. This prompted Min et al. (2008) to further extend the concept by defining supply chain identity salience (SCIS), which reflects the extent of a firm's sense of belonging to a particular supply chain. The authors further note that "a firm attains supply chain identity salience within a supply chain when: (1) it perceives itself as an active participant in the social, political, and economic activities of that supply chain; (2) other firms identify it as a part of the supply chain; (3) it believes it is an integral part of the day-to-day operations of the supply chain and (4) it recognizes the systemic, strategic importance of perceiving and being perceived as a part of that supply chain" (p. 285).

Against this framing, we highlight an important aspect for enhancing the understanding of SCIS. As such, when Min et al. (2008) note that "similar to people, firms possess multiple identities and play different roles with different degrees of supply chain identity salience in different supply chains" (p. 285), they portray the identification of organizational members with an organization and an organization's identification with its supply chain as distinct phenomena. We suggest that supply chains are the ultimate focus of identification available to members at an organizational level. Reaching SCIS is not possible unless members, who identify collectively with their organization, also consider the organization's supply chain as being a part of their larger self. In doing so, members collectively subdue their self-concept and represent the collective consciousness of the organization among participating organizations in the supply

chain (cf. Humphreys and Brown, 2002; Min et al., 2008; Roy et al., 2018a). This can be seen within our contemporary reality where companies operate as part of larger value chains, with each organization within the supply chain striving to fulfill its value proposition for which it is accountable for as part of the chain. This perspective resonates well with the few empirical findings in the traditional supply chain management literature that recognize the importance of inter-organizational citizenship behavior (Esper et al., 2015) and offers evidence for the impact of supplier-to-buyer identification on operational performance (Corsten et al., 2011). Thus, reflecting on the contextualization of SSCM and drawing from the concept of identification, SCIS can be understood as facilitating the percolation of sustainability imperatives to organizational members, being indicative of their intent toward playing their collective part in fulfilling the supply chain objectives faced by their organization. SCIS may further serve as a foundation for the development of intra- and inter-organizational shared norms and attitudes that facilitate actions aimed at fulfilling supply chain objectives. This further implies that an SSCM transformation is fundamentally dependent on SCIS for deriving intent toward needed efforts—within an organization—and subsequently within a supply chain (cf. Gattiker and Carter, 2010; Signori et al., 2015).

Therefore, SCIS forms the first dimension of DES and reflects the intent of organizational members toward the differential efforts needed in an SSCM response. Further, at lower levels of SCIS, achieving an organizational response toward DES is difficult—primarily due to the weak intent among organizational members in embracing SSCM (cf. Gattiker et al., 2014); such organizations may fail to recognize SSCM as a legitimate supply chain objective (cf. Crespin-Mazet and Dontenwill, 2012; Glover et al., 2014). An SSCM response in these circumstances may be very difficult to initiate and further faces the risk of rollback. Conversely, at higher levels of SCIS, organizational members perceive SSCM as an organizational issue with high priority—and thereby create strong perceptual grounds for DES as part of the SSCM response. This leads to the following proposition:

Proposition 1: As organizational efforts toward supply chain identity salience (SCIS) increase, the legitimacy perception of SSCM as a supply chain objective is enhanced, and the organizational intent (i.e. the collective intent of organizational members) toward differential efforts in SSCM strengthens.

3.1.2 Organizational citizenship sustainability behavior

Emanating from the relevance of favorable organizational intent toward DES, it is also essential to characterize the transition of this intent to organizational action as part of the organizational SSCM response. Katz (1964) describes three behavioral patterns essential for organizational functioning. First, people joining and thereby staying in the organization. Second, people meeting standards regarding performance. And third, spontaneous and innovative actions toward organizational requirements that go beyond specified requirements. The third idea is intriguing because of its vitality toward organizational survival—yet, inherent difficulties exist in formally prescribing such expectations. A general consensus regarding the nature / label of this component has usually converged around organizational citizenship behavior (OCB). Originally conceptualized by Organ (1988), OCB pertains to extra-role behaviors that are non-rewarded and in the aggregate promote the effective functioning of an organization. Furthermore, organizational identification is often recognized as an important prerequisite and essential foundation toward the generation of OCB (Dick et al., 2006). Frenkel et al. (2012) outline that employees offer OCB primarily due to their identification with the organization. The authors further suggest that organizational identification facilitates a favorable interpretation of organizational policies and practices—and thereby leads them to promote the policies and practices through OCB.

Scholars have commenced to focus upon the essentiality of OCB in facilitating sustainable development initiatives. As such, Ramus and Killmer (2007) note the vitality of pro-social extra role behaviors in overall corporate greening. This is followed by Boiral (2009), who conceptualizes the application of principal OCB dimensions in responding to organizational challenges concerning environmental management. This further led scholars to propose the concept of "organizational citizenship behavior for the environment" (OCBE), which is defined as discretionary (unrewarded) behaviors performed by organizational members, whereby they cooperate with their organization by performing behaviors in the workplace that benefit the natural environment (Boiral and Paillé, 2012; Daily et al., 2009). A recent study by Montabon et al. (2016a), focusing upon the identification of antecedents to OCBE, highlights the importance of OCBE in facilitating SSCM. We thus further their lead to explicate OCBE as a requirement of an action-specific DES component.

Specifically, DES implies the need for discretionary steps by organizational members toward facilitating an SSCM response. These steps are unrewarded and broadly relate to the generation of support and practical initiatives toward SSCM—thereby facilitating the development and sharing of knowledge (cf. Boiral, 2002; Cheng, 2011; Gao and He, 2017)—with the objective to incorporate SSCM practices in existing organizational supply chain routines. We therefore refer to Boiral and Paillé (2012) for suggesting an extension of OCBE's scope toward DES—by explicating its intrinsic dimensions—in an SSCM context. Specifically, these intrinsic aspects are based on the dimensions of *civic engagement*, *helping*, and *initiatives*; the outcome we label as *organizational citizenship sustainability behavior*.

'Civic engagement' has been defined as voluntary participation in environmental programs and activities of the organization, and thereby is indicative of support. In an SSCM context, this would imply actions toward the voluntary support of SSCM commitments of an organization. Such actions may involve active participation in informative events regarding SSCM initiatives within an organization, attempting to gather information regarding needs and requirements concerning SSCM, and fostering awareness toward SSCM among various stakeholders. This further reflects the tenet that organizational actions may not be readily aligned with official commitments regarding SSCM—and, therefore, SSCM principally requires actions toward such alignment (cf. Gattiker and Carter, 2010; Touboulic et al., 2014). The following proposition reflects this aspect:

Proposition 2: Facilitating an organizational SSCM response is ineffective without organizational support. An SSCM-based civic engagement accounts for actions aimed at generating support toward organizational SSCM commitments.

'Helping' refers to assisting colleagues with the integration of environmental concerns in the workplace. An extension of this aspect within the SSCM context would imply voluntary helping or mutual support for organizational members, while attempting the incorporation of desired SSCM approaches in organizational supply routines. Further, given the radical nature of change (complexities) involved in SSCM—it is almost impossible to achieve solutions by attempting the incorporation in isolation (cf. Hoof, 2014; Remmen and Lorentzen, 2000). As such, crafting solutions often requires an interdisciplinary

approach—which is facilitated by promoting discussions and cooperation—as part of knowledge creation (cf. Boiral, 2002; Ramus and Killmer, 2007; Remmen and Lorentzen, 2000). This suggests the importance of collective assistance during the SSCM incorporation process. For example, in order to successfully incorporate waste reduction, providing help to the organizational members directly associated with it is beneficial—to identify various sources of waste generation and thereby assisting in devising possible solution sets. This leads to the following proposition:

Proposition 3: Facilitating an organizational SSCM response requires collective assistance in order to generate mutual support leading to knowledge—this is especially critical when facing the complexities during the incorporation process. SSCM-based helping accounts for collective-level action of organizational members in facilitating SSCM.

'Initiatives' are a form of discretionary behavior and involve personal creative ideas and suggestions for improving environmental practices and performance. Within an SSCM context and taking an organizational perspective, this would imply innovative initiatives of organizational members for the effective functioning of SSCM in their direct work activities. As such, members may start weighing the consequences of their actions with respect to enhancing the stance of SSCM. This may further involve members striving to innovatively maintain an account as it relates to the TBL in their direct work activities. For example, on a production line, members may start separating wastes that can be easily re-used. Such initiatives primarily act as the source for personal-level innovation, which may be useful in the generation of new knowledge about SSCM (Boiral, 2002; Gualandris and Kalchschmidt, 2014; West and Altink, 1996). Preliminary insights have also started to emerge in the literature in this regard. Longoni and Cagliano (2018), based on the inputs from ten exemplar cases, outline the relevance of innovation in facilitating SSCM. Specifically, the authors theorize about the continuous nature of organizational efforts toward SSCM innovation—through a longer horizon of operational attempts in balancing the TBL trade-offs with supply chain practices, the learning from failures in the past, and the ability to withstand uncertainty. Mores et al. (2018), taking an SSCM angle, demonstrate the production of green plastics through innovative substitution of input materials. Silva et al. (2019) propagate the criticality of collective

organizational efforts through product- and process-related innovation to facilitate the implementation of SSCM practices. The following proposition can be derived based on this discussion.

Proposition 4: Facilitating an organizational SSCM response requires innovative initiatives from organizational members, creating new knowledge about SSCM in order to ensure the effectiveness of SSCM in direct work activities. SSCM-based initiatives account for the innovative response of organizational members to enrich SSCM knowledge.

3.1.3 Toward an integrative view of DES

SSCM theory offers only limited insight for explaining a fundamental aspect concerning the SSCM transformation: why organizational members would intend to channel their efforts toward SSCM—which involves a radical change in their usual work protocols (cf. Gattiker et al., 2014; Gattiker and Carter, 2010; Lo, 2014; Preuss and Walker, 2011). Further, the decision regarding an SSCM implementation may originate within the organization, or it may come from the supply chain (Roy, 2019). However, considering the overall bottom-line, it is mandatory for organizational members to exhibit compliance with SSCM (cf. Foerstl et al., 2015). In this regard, DES is indicative of *supply chain identity salience* as a critical element in generating the needed intent toward SSCM transformation. Specifically, it suggests that the percolation of SCIS within the organization is essential to make organizational members interpret SSCM as a legitimate supply chain objective. Therefore, this creates favorable grounds for members to engage in SSCM.

Furthermore, in conjunction with strong SCIS, an effective SSCM response requires organizational members to exhibit voluntary and unrewarded involvement—toward the incorporation of desired SSCM approaches in organizational supply chain routines (Montabon et al., 2016a). Therefore, DES propagates the value of *organizational citizenship sustainability behavior* in delineating the specific nature of actions / efforts. Thus, when OCSB is low, it may suggest a lack of attempts in the form of voluntary actions from organizational members toward an SSCM response. In contrast, a high level of OCSB reflects ongoing lively actions toward SSCM. This leads to the following proposition:

Proposition 5: Differential efforts in SSCM (DES) vary between organizations in the supply chain based on their supply chain identity salience (SCIS) and their inherent organizational citizenship sustainability behavior (OCSB).

Overall, the multi-dimensional definition of DES is indicative of the vitality of differential efforts in facilitating SSCM. Further, against the backdrop of the elemental aspects inherent in the SSCM transformation (Figure 1 and Table 1), DES is helpful in explicating the intrinsic reconciliation inherent in an SSCM response for characterizing efforts toward *intent* generation and efforts toward *action* as part of the SSCM transformation. Thus, SCIS and OCSB intimately account for the differential efforts, above and beyond what is required in existing supply chain routines, in order to facilitate the inclusion of the desired SSCM practices toward SSCM transformation via an *organizational SSCM response*. The following proposition helps to facilitate an integrative picture:

Proposition 6: DES serves as the foundation for issuing an organizational SSCM response to tackle organizational complexities. This is an essential aspect toward capturing force-fields in order to successfully incorporate desired SSCM practices into organizational supply chain routines.

Based on these propositions, Figure 4 updates the basic framework of the SSCM Force-field in light of the insights derived from the notion of DES.

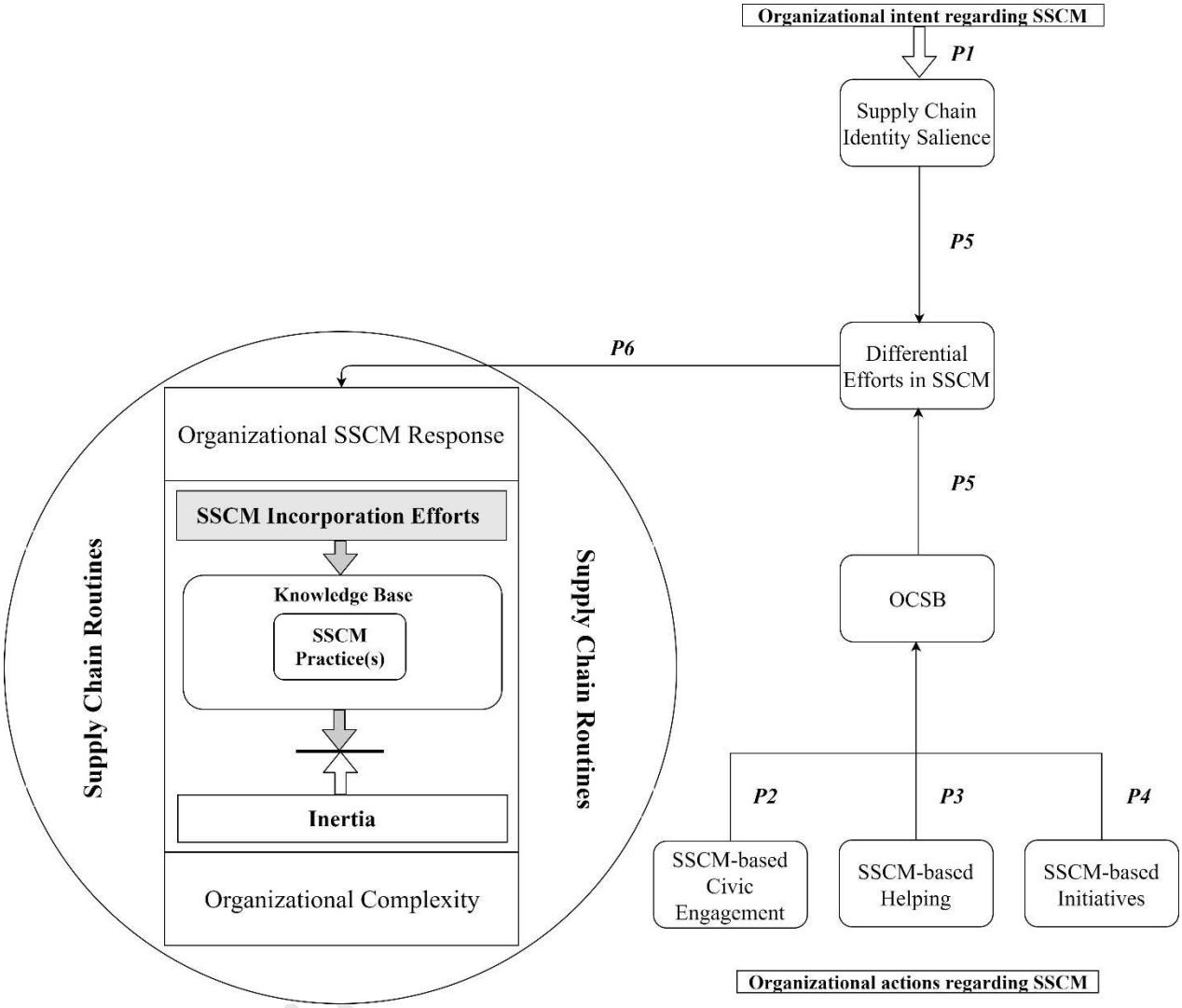

Figure 4 An integrative view of DES and the SSCM Force-field

4. Discussion and implications

The present state of the SSCM literature calls for the need to further strengthen the conceptual foundation of SSCM theory—in order to better understand the dynamics underlying the transition from traditional to sustainable supply chains. As such, the literature in recent years has witnessed an emergence of evaluative concepts that confer insightful perspectives guiding the discourse of scholarly investigation surrounding SSCM. Gold and Schleper (2017) for example highlight that "a coherent theoretical foundation for guiding companies toward a stronger integration of sustainability into their operations and supply chains is still missing" (p. 425). The authors further suggest that the pathway toward capturing a deeper essence of sustainability in SSCM depends upon proactive efforts by firms toward the

transformation of their supply chain practices. However, perspectives in this regard are still limited, and concrete directives are absent, rendering SSCM as a complex undertaking. Resultantly, the SSCM literature in recent years has marked the onset of perspectives that represent the complex nature of SSCM (Markman and Krause, 2016; Pagell and Shevchenko, 2014; Quarshie et al., 2016; Roy et al., 2018b; Silvestre, 2015).

Building on this backdrop, and through this conceptual review, we develop a case to suggest that the complex journey involved in SSCM can be viewed at the strategic as well as the operational level of transformation. Thereby, to facilitate theoretical developments, we conceptualize the complex nature of this journey at the operational level of transformation, and taking an organizational unit of analysis perspective, we exemplify the sustainability-oriented transformation of a supply chain organization through the uptake of SSCM practices in its supply chain routines. More specifically, drawing from underpinnings inherent in 'complexity theory' (Anderson, 1999; Styhre, 2002), we conceptualize the dynamic fundamental forces that impart the operational transformation of a supply chain organization with 'non-linearity'. Constituting the first key contribution of this conceptual review, these dynamic fundamental forces (organizational SSCM response and organizational complexities) are propagated through the novel concept of the 'SSCM Force-field' to account for the non-linearity ingrained in the operational and organizational journey toward SSCM.

The magnified view of this force-field further extends the five dynamic channels to finely characterize the non-linear nature of SSCM transformation. As such, every channel within the force-field intricately captures a complex frontier of conflict between organizational efforts toward SSCM (SSCM incorporation efforts) and inertial forces that negate the organizational efforts (with inertia representing the manifestation of organizational complexities). These channels include: (a) efforts toward the re-shaping of the organizational environment and the inertia of top management teams to govern the re-shaping, (b) efforts toward the operationalization of SSCM practices at the ground-level and the inertia prevailing among the organizational members due to cognitive and affective tensions surrounding SSCM, (c) collective efforts of organizational members toward SSCM and the inertia emerging from the reluctance of organizational members to embrace change in working patterns, (d) efforts toward achieving internal integration of

SSCM and the inertia derived from inter-departmental resistance, as well as (f) efforts toward achieving external integration of SSCM and the inertia emerging from inter-organizational resistance.

Apart from characterizing the dynamic conflict prevailing within the force-field, these channels (and their constituting forces) can be understood as foundational anchors to further enrich SSCM theory. As such, each individual force within a force-field channel is capable to define a unique investigative orientation for SSCM research. For example, the inertial force surrounding the criticality of a supportive top management team, as noted within the first channel of the force-field, has recently witnessed an explicit recognition in the SSCM literature through an in-depth examination (cf. Kumar and Paraskevas, 2018). Similarly, the recognition of the remaining forces in SSCM research is either emerging or loosely connected. For instance, to date only relatively few perspectives in the SSCM literature present an account of operational efforts by organizational members during the incorporation of SSCM in organizational routines (Roy et al., 2018a). Thus, these forces, when deliberated in-depth, can augment the strength of SSCM theory with intriguing perspectives for the future.

The second key contribution also lies within the concept of the force-field. Specifically, the notion extends a theoretical basis to characterize the SSCM transformation phenomena as an on-going journey based on continuous organizational efforts. As such, the force-field shows how organizational progress in SSCM is vitally dependent on the enrichment of the knowledge base contained in supply chain routines to counter organizational complexities. Therefore, this input further specifies an intrinsic orientation desirable in organizational SSCM efforts, i.e. it suggests that SSCM incorporation efforts, to be effective, must aim at generating new knowledge about SSCM. Thus, another anchor to enrich the foundation of SSCM theory in future research is identified herein.

The third, and in our view the most important contribution lies in the characterization of another novel concept termed as ‘Differential Efforts in SSCM (DES)’. As such, drawing from the fundamental characteristics of SSCM transformation as outlined in the notion of the force-field, DES facilitates a structure by defining a system of organizational efforts that can be instrumental in shaping the SSCM journey of firms. More specifically, DES propagates from the intrinsic nature of efforts desirable in SSCM

by reflecting on the operational actions that (a) generate a favorable intent among organizational members to recognize SSCM as a legitimate supply chain agenda, (b) specify the nature of collective organizational efforts desirable in SSCM, (c) orient the organizational efforts to generate new knowledge about SSCM, and (d) explain why organizational engagement in SSCM is progressive in nature.

DES is viewed as the additional effort above and beyond what is required in existing supply chain routines for facilitating the inclusion of a desired SSCM practice in the organization. In so doing, it is implied that the differentiated efforts from organizational members—toward the organizational SSCM response—are resultant of the efforts channeled toward the generation of favorable intent among organizational members—and the efforts channeled for transforming the favorable intent to ground-level actions. Supply chain identity salience and organizational citizenship sustainability behavior are suggested as two facilitating aspects in this regard. Thus, this multi-dimensional construct, when operationalized in SSCM research, can facilitate fresh insights on SSCM theory and practice. In this vein, future research can further explore the conditions that lead to either high or low DES in SSCM. Overall, this review integrates diverse fundamental elements of SSCM transformation from an operational / organizational perspective.

4.1 The strategic, operational, and individual view of complexity in SSCM

Drawing from complexity theory, the operational-organizational view of SSCM transformation (please see Appendix I for alternate potential views) extends the notion of 'Organizational Complexity' to account for the ultimate state of *inertia* emerging from (a) the analytical sophistication faced by organizational members to understand the paradigm of sustainability while operationalizing SSCM, and (b) the extended purview of organizational transformation in the wake of SSCM that fundamentally relies on the proactive efforts of organizational members to incorporate SSCM practices into organizational supply chain routines. Organizational complexity therefore represents a fundamental force (within the holistic notion of the force-field) to explain the phenomena surrounding non-linear organizational transformation toward SSCM.

'Organizational Complexity' facilitates a conceptual ground to explain the 'Strategic Complexity' inherent in SSCM. First, owing to the eventual state of inertia during the operationalization of SSCM

practices into the routines of its member firms, a supply chain might require a logic to carefully strategize the course of SSCM transformation (Montabon et al., 2016; Sayed et al., 2017). Second, the inertia extrapolates why achieving a supply-chain-wide buy-in on SSCM would involve a non-linearity in the first place (Frostenson and Prenkert, 2015; Gosling et al., 2017; Tachizawa and Wong, 2015). As such, in an anticipation of the inertia (and ultimately the force-field) related to SSCM to be encountered within their respective organizational boundaries, member firms of the concerned supply chain might not readily accept the remodeled agenda of supply chain management.

Linked to the operational and strategic views of complexity in SSCM, 'Individual Complexity' forms a highly latent foundation of complexity in SSCM transformation. As such, in-depth perspectives are desirable to understand what prompts an individual within a firm to embrace behavioral shifts desirable in the execution of SSCM (either strategically or operationally). The recent work by Goebel et al. (2018) aligns with the individual unit of analysis and the operational level, due to their focus on understanding the individual-intrinsic attributes of purchasing managers (for example altruism, conservationism, self enhancement, openness to change, and so on) that shape their willingness to pay for sustainability attributes in supply chain transactions. To shape the perspective of 'Individual Complexity' in SSCM, either strategically or operationally, the cognitive and affective dimensions underscored in our organizational view can be explicated further from an individual-intrinsic and non-collective SSCM viewpoint.

4.2 Practical implications

Several implications can be extracted from this conceptual review to inform the practice surrounding SSCM. First, the conceptualization outlines the overarching criticality of weaving a favorable intent among organizational members, which facilitates their positive view of the SSCM transformation. As such, this intent plays an elemental role in easing the inertia, and orients organizational members to demonstrate operational efforts toward the pursuit of SSCM. Drawing from social identity theory, the paradigm of 'supply chain identity salience (SCIS)' accounts for the identification of organizational members in regards to serving and supporting the membership of their firm in a sustainable supply chain. Thus, an

organization high on SCIS becomes more capable to propel the SSCM agenda among its organizational members. Higher SCIS in this context can be reflected under the following frontiers of collective action: (a) organizational members owning the firm's commitment toward a supply chain, (b) organizational members willing to engage more than absolutely necessary for the membership of their firm in a supply chain, (c) organizational members getting actively involved in supply chain matters of their firm, (d) organizational members enjoying to work for the supply chain interests of their firm, and (e) organizational members feeling proud about the membership of their firm in a supply chain (cf. Ashforth and Mael, 1989; Dick et al., 2006; Min et al., 2008). Thus, a firm's progress in SSCM requires boosting the legitimacy perception of its organizational members, so that the members become more willing to fulfill the supply chain objectives faced by the firm.

Second, the conceptualization outlines operational protocols to channel organizational members' SSCM willingness into ground-level efforts that are largely above and beyond of what is expected and are generally not rewarded. Further, these operational protocols are complementary to each other, and altogether are essential in generating new knowledge on SSCM to ensure that a targeted SSCM practice is successfully incorporated into organizational supply chain routines. These protocols are manifested within the spaces of SSCM-based civic engagement, helping, and initiatives.

Progress toward 'SSCM-based civic engagement' can be reflected within the frontiers of: (a) active participation of organizational members in the firm's briefings about SSCM, (b) organizational members trying to gain information on practices that are based on SSCM, (c) organizational members acting in support of the positive image of their firm in regards to SSCM, and (d) organizational members volunteering to make the agenda of SSCM mainstream within the firm. 'SSCM-based helping' can be reflected in the following actions of members: (a) organizational members assisting each other while implementing SSCM practices, (b) organizational members encouraging each other to understand the intricacies of practices that are based in SSCM, and (c) organizational members sharing their tacit experience gained while dealing with SSCM practices. Similarly, the reflective frontiers of 'SSCM-based initiatives' can involve: (a) organizational members carrying out innovative actions in their daily routines toward the facilitation of SSCM practices, (b) organizational members making suggestions within and

outside of their direct work responsibility toward the facilitation of SSCM practices, and (c) organizational members weighing the consequence of their actions in daily routines to strengthen SSCM practices (Boiral, 2002; Boiral and Paillé, 2012; Montabon et al., 2016a; Paillé and Boiral, 2013).

These implications are of pivotal importance for imparting fresh perspectives into the SSCM domain. As such, they outline elemental organizational perspectives that must be strengthened especially by any profit-oriented firm while executing a sustainability-oriented transition towards SSCM. Thus, these implications generate intriguing insights surrounding the theory and practice of SSCM.

5. Conclusion

The proposed conceptualization facilitates interesting perspectives on furthering the understanding of sustainable supply chains from an organizational perspective. Most importantly, it suggests that the SSCM transformation is characterized by a non-linear transition path—primarily due to the endless interplay between organizational SSCM efforts and organizational complexities in facilitating radical changes. The non-linearity restricts any SSCM practice from being quickly or easily absorbed into organizational supply chain routines. Further, an implemented SSCM practice is always posed with the risk of rollback, i.e. the specific approach losing its place in organizational supply chain routines. Therefore, the SSCM transformation is an endless journey, where multifarious efforts are responsible for guiding the transition from traditional to sustainable supply chains. In order to characterize the inherent endless journey, a novel concept of the SSCM Force-field is introduced—for representing the fundamental aspects, acting in favor and against the SSCM transformation from an organizational viewpoint. In addition, the novel concept of Differential Efforts in SSCM (DES) is proposed for characterizing the central nature of organizational efforts necessary for guiding the progressive SSCM journey. Overall, these perspectives extend interesting insights and implications for strengthening the conceptual foundation of SSCM theory—specifically, by characterizing the elemental nature (and its key aspects) of the journey involved in SSCM. However, the purely conceptual intent of this research also generates a limitation, which demands an empirical investigation of the defined concepts. Nevertheless, future research can draw interesting orientations from the conceptual underpinnings deliberated in this review to explore fresh insights surrounding the theory

and practice of SSCM.

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Appendix I: Illustration of how SSCM can be investigated, and our focus on the operational-organizational perspective

		Unit of Analysis		
		Network	Organizational	Individual
Orientation Level	Strategic orientation toward SSCM	Developing the value proposition for SSCM by for instance taking a TBL orientation and focusing on market forces and the competitive landscape. *(Additional note: this orientation is more prevalent in the strategic literature of corporate social responsibility)*	Taking a supply chain leader's perspective, and focusing on control / governance mechanisms to facilitate the buy-in of supply chain organizations toward SSCM. *(Additional note: for example, Gosling et al. (2017) emphasize governance through which a supply chain leader can promote inter-organizational learning among firms within a supply chain to uptake SSCM)*	Emphasizing the *behavioral or intrinsic propensity* of *an individual* with strategic decision-making authority to recognize the legitimacy of SSCM and to ensure the advocacy of the supply-chain-wide transition toward SSCM. *(Additional note: this is a highly latent perspective)*
	Operational orientation toward SSCM	Investigating mechanisms for the operational proliferation of SSCM among a network of firms / supply chains. *(Additional note: for example, Nair et al. (2016) outline the mechanism for the proliferation of operational innovation in a supply network)*	Operationalizing SSCM from a firm-intrinsic view and focusing on organizational components, such as policies, processes, and collective efforts of organizational members. *(Additional note: our focus on this article)*	Emphasizing the *behavioral or intrinsic propensity* of *an individual* with operational decision-making authority to comply with and facilitate the operational demands of SSCM. *(Additional note: for example, Goebel et al. (2018) focus on intrinsic characteristics of an employee deployed at the purchasing interface to support SSCM)*

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Highlights

- A conceptual review of the transformation from traditional to sustainable SCM
- Consideration of operational complexities inherent in sustainable SCM
- Emphasis on organizational efforts and mechanisms for the transformation
- Proposition pertaining to the SSCM Force-field and Differential Efforts in sustainable SCM

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Declaration of interests

☒ The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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