

A systematic metaphor analysis of academic discourse in sustainable supply chain scholarship: the results of a pilot study.

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Abstract

The paper outlines findings of a pilot investigation into conceptual metaphors used within sustainable supply chain (SSC) scholarship. Drawing on Cognitive Metaphor Theory the study assumed that dominant conceptual metaphors underlie academic reasoning about SSCs and act as enablers and inhibitors of that reasoning. A systematic metaphor analysis utilising the Metaphor Identification Procedure identified dominant conceptual metaphors for sustainability and the sustainability-supply chain relationship. It is proposed that these conceptual metaphors provide evidence and explanation for tendencies towards incremental reform, the prioritization of economic performance, chain-sustenance, and a potentially (dangerously) inuring effect for “sustainability” which may be inhibiting “thinking differently.”

Keywords: Sustainable supply chains, Metaphor analysis, Sustainability

Supply chains for sustainability

The effects of globalisation have interacted with management trends towards vertical disintegration leading to long and complex inter-organisational networks of supply and demand (Chen and Paulraj, 2004). Recognition of organisational responsibilities for sustainability have thus extended outside the boundaries of a single organisation (Carter and Rogers, 2008). Matthews et al. (2016) have articulated the important place of supply chain management in sustainable development research highlighting that while supply chains play a significant role in environmental degradation they also represent great opportunity for achieving the change required for a sustainable future. It is thus both unsurprising and encouraging to note that research into “sustainable supply chain management” (SSCM) is burgeoning (Carter and Easton, 2011; Touboulic and Walker, 2015).

In light of suggestion that the environmental crisis is worsening (Rockstrom et al., 2009), however, Matthews et al. (2016, p.83) suggest that current sustainable supply chain scholarship's emphasis on win-win scenarios have failed to provide adequate theoretical explanation for how supply chains can contribute to the challenge of "returning the political-economic system from a state of ecological overshoot". Others have suggested that dominant approaches to SSC research have been founded upon an *economically* dominant logic which may be at odds with the true requirements of sustainability. Reflecting longstanding observations in broader organisational management and sustainable development research (Shrivastava, 1994, 1998; Gladwin et al., 1995; Daly 1996), recent literature has called for an *ecologically* dominant logic in supply chain research which prioritises ecological health over what is good for the firm or chain (Montabon et al., 2016; Markman and Krause, 2016). It therefore seems to suggest that a challenge for future SSC scholarship is the achievement of (in the words of Gladwin et al. [1995, p.899]) a "new mind" among supply chain scholars and practitioners which is appropriate for a sustainable world: a new mind which accepts SSCM as more than simply a sub-set of SCM (Pagell and Shevchenko, 2014); which puts the natural environment at the top of the list of stakeholders (Montabon et al., 2016; Markman and Krause, 2016) and which seeks an answer for how supply chains can contribute to the challenge of achieving sustainability (Matthews et al., 2016). The present authors propose that such an achievement requires recognition of the role of metaphor in cognitive reasoning, and therefore in supply chain thought and action as it addresses the challenge of sustainability (Lakoff and Johnson, 1980; Alvesson and Kärreman, 2000).

A metaphor perspective

In recent decades, organisational and management studies' adoption of metaphor has reflected a theoretical perspective on the metaphorical nature of the human conceptual system - the system in terms of which humans think, understand and therefore act (Lakoff and Johnson, 1980; Lakoff, 1993). In the context of the burgeoning imperatives of sustainability, several authors have foregrounded concern for the dominance of certain conceptual metaphors which may be considered incongruent with the requirements of sustainable development (c.f. Barter and Russell, 2013; Jones, 2012; Milne et al., 2016). The present study thus similarly assumes the value of adopting a metaphor perspective as a contribution to critical reflection within the supply chain field, and therefore aims to explore how metaphor affects academic reasoning about sustainable supply chains and their management.

Methodology

A systematic metaphor analysis of the discourse contained within published academic journal articles was conducted. The sample for the study consisted of the five most highly cited published, peer-reviewed academic journal articles which included the phrase "sustainable supply chain" in their title (notated with * in reference list). These articles were identified through a specific title search within two journal databases – SCOPUS and Web of Science - on 28.6.17. Metaphor analysis is an approach to the analysis of qualitative data that is consistent with the assumptions of Cognitive Metaphor Theory (CMT). It involves the identification of linguistic metaphors, or metaphoric linguistic expressions (MLEs) - the

metaphors enacted at the level of spoken or written language) which provide evidence for the existence of conceptual metaphors which exist at the level of thought. The metaphor analysis procedure consisted of two key stages: first, identification of linguistic metaphors in the discourse and second, analytic construction of conceptual metaphors of which the linguistic metaphors are considered manifestations.

Metaphor analysis stage 1: Identifying the linguistic metaphors

Central to the successful execution of metaphor analysis is the effective identification of words/phrases which have the potential to be interpreted metaphorically (MLEs). Most novel metaphors may be relatively easily identified, but “dead” or conventionalised metaphors are less easily spotted on the basis that they have become so familiar in everyday use that their metaphorical nature is no longer obvious. Additionally, most words can be used both literally or metaphorically depending on the context in which they are used. Linguistic metaphors were identified using the Metaphor Identification Procedure (MIP) (Pragglejazz, 2007). In line with the recommendations made by Deignan (2015), Macmillan English Dictionary for Advanced Learners (2007) was used to facilitate the MIP along with an Excel spreadsheet to record accompanying notes on the rationale and justification of the acceptance or rejection of the metaphoric nature of a potential linguistic metaphor.

Metaphor analysis stage 2: Constructing the conceptual metaphors

In CMT, MLEs act as observable evidence of the cognitive framings that shape our thoughts and action on a particular subject. The process of identifying the conceptual metaphors of which linguistic metaphors are considered to be evidence constitutes a more problematic and contentious aspect of metaphor analysis procedure. While the MIP offers a systematic procedure for identifying linguistic metaphors, a comparable process for discerning conceptual metaphors of which linguistic metaphors are evidence is relatively less well established (c.f Semino et al., 2004). We developed a long list of linguistic metaphors across the sample. Through interpretive reflection and refinement with close reference to the data we constructed 6 conceptual metaphors for SUSTAINABILITY and 5 conceptual metaphors for SUSTAINABILITY-SUPPLY CHAIN RELATIONSHIP.

Results

This section will outline each of the conceptual metaphors identified through the study, with a small number of illustrative examples of their surface manifestations as MLEs.

SUSTAINABILITY is MACHINE

MLEs in the academic discourse suggested that sustainability is a MACHINE that is constructed from various *components* and *parts* and *driven* by external and internal factors. These components need to be properly *aligned* and configured for its effective *operationalisation* and *performance* (Table 1).

Table 1 – sample of MLEs illustrating SUSTAINABILITY is MACHINE

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| <ol style="list-style-type: none">1. “Sustainability consists of three <i>components</i>” (C&R2008)2. “business models that <i>aligned</i> the elements of the triple bottom line were profitable (P&W20093. “...whether <i>driven</i> by current legislation, public interest or competitive opportunity” (L2007) |
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| <ol style="list-style-type: none"> 4. “almost every study posits a different task/behaviour/investment as being the <i>key</i> to being sustainable” (P&W2009). 5. ...one central concept helping to <i>operationalize</i> sustainability ...(S&M2008) |
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Sustainability is also seen as a *part* of a wider machine which must be *integrated, tied, linked* and *applied* to or within a wider system, whether that be the organisation, organisational strategy, or the supply chain.

Table 2– sample of MLEs illustrating SUSTAINABILITY is a MECHANICAL PART

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| <ol style="list-style-type: none"> 1. “...each of these organizations has pockets where sustainability has not gained <i>traction</i>” (P&W2009) 2. “HP”s sustainability strategy is...one of the primary <i>parts</i> of its overall business strategy” (C&R2008) 3. “In its annual sustainability report, IBM...describes the <i>integration</i> of its triple bottom line strategy with its core business strategy” (C&R2008) |
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The analysis revealed that this has implications for the way in which the relationship between sustainability and supply chain is viewed. Sustainability is therefore similarly seen as a mechanical part which is *tied to, integrated* within and *interfaces* with the existing supply chain machine leading to a perception of a sustainable supply chain as a MECHANICAL FIX.

Table 3- sample of MLEs illustrating SUSTAINABILITY-SUPPLY CHAIN RELATIONSHIP is MECHANICAL FIX

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| <ol style="list-style-type: none"> 1. “Companies <i>integrate</i> the triple bottom line into both their internal operations and their broader supply chains (C&E2011) 2. “To <i>create</i> a sustainable chain managers need to <i>integrate</i> sustainability goals, practices and cognitions into day-to-day supply chain management” (P&W2009) 3. “...<i>tie</i> supplier selection decisions to sustainability goals (P&W2009) 4. “The key <i>interfaces</i> that sustainability has with supply chain management strongly suggests that sustainability is ...license to do business” (C&E2011) |
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SUSTAINABILITY is a JOURNEY

MLEs in the academic discourse also suggested that the achievement of sustainability is seen as a JOURNEY. Organisations are seen to be on a *path*, with management practices representing *pursuit* of sustainability, through *steps* and *moves* towards the sustainability destination. Upon that journey, there are those organisations that have progressed further and are thus *leading* other organisations on the path (with such exemplary organisations becoming the focus of empirical research studies, e.g Pagell and Wu [2009]) drawing on *guides* to ensure journeying in the right direction. Meanwhile other travellers (organisations or employees for example) *lag*, face *barriers* or need incentive to *follow through* on their journey. The history of the evolution of the sustainability concept can thus be *traced back* in terms of the path that has already been travelled and represents progress in terms of *moving us beyond* our current thinking about organisational or supply chain management. An interesting related entailment of this metaphor is the degree of *convergence* and *divergence* of perspectives on sustainability, and thus the extent to which different organisations or stakeholders are travelling on the same path to the sustainability destination. Moreover,

sustainability is understood as entailing an *intersection* on the journey as different paths converge on the road that leads directly to sustainability. While Carter and Rogers (2008) suggested that there “*exists a divergence of definitions of sustainability*”, Carter and Easton (2011) found “the beginnings of the *convergence* of perspectives of sustainability as the triple bottom line”.

Table 4 – sample of MLEs illustrating SUSTAINABILITY is a JOURNEY

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| <ol style="list-style-type: none"> 1. “we directly explored what more sustainable companies do that is unique and that can inform others attempting to <i>follow the same path</i>” (P&W2009). 2. ...employees need to be trained in sustainability ..and then given incentives to <i>follow through</i> (L2007) 3. First consideration of sustainability can be <i>traced back</i> to (L2007) 4. This thinking <i>moves us beyond</i> the simple question, “Does it pay to be green?” (C&R2008) |
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The consideration of supply chain management in the context of sustainability is seen to be an essential stepping stone on the path towards sustainability. It constitutes *progress* and a *step towards* the achievement of sustainability. The composite concept of sustainable supply chains is thus indicated by the image of converging pathways. Interestingly, the linguistic metaphor of *explore* was also invoked suggesting an element of the unknown and the need to blaze the trails that will lead to/must be trod to reach the sustainability destination. For Pagell and Wu (2009), this is not necessarily via the same path that has always been trod (Table 5, MLE 4).

Table 5 – sample of MLEs illustrating SUSTAINABILITY-SUPPLY CHAIN RELATIONSHIP is PROGRESS ON A JOURNEY.

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| <ol style="list-style-type: none"> 1. “A focus on supply chains is a <i>step towards</i>... (L2007) 2. “Concern for closing loops and reverse logistics does seem to be required to make further <i>progress toward</i> sustainability (P&W2009) 3. “Consideration is given to the <i>convergence</i> of supply chains and sustainability (L2007) 4. “many of the organizations in our sample are profitably <i>moving in a different direction</i>” (P&W2009). |
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SUSTAINABILITY is an ORGANISM

The view of sustainability as an ORGANISM characterises reasoning about the concept in terms of its historical development: it has multi-disciplinary *roots* and, over time, the concept is understood to have *evolved* and *grown* from *embryonic stages*, similarly suggesting that the field of sustainable supply chain is in itself an organic entity which is *growing*.

Table 6 – sample of MLEs illustrating SUSTAINABILITY is an ORGANISM

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| <ol style="list-style-type: none"> 1. “Sustainability has deep <i>roots</i> in both the physical and social sciences” (L2007) 2. “The conceptualisation and management of social and environmental issues has <i>evolved</i>, from what we term standalone, through the notion of social responsibility, and finally to the concept of sustainability. We describe this <i>evolution</i> next” (C&E2011) 3. “the papers in the special issue are positioned within the <i>growing</i> study of sustainable supply chains” (L2007) 4. “During the <i>embryonic</i> stages of its adoption in practice” (C&R2008) |
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However, the organism metaphor is also invoked to emphasise the importance of sustainability in terms of its ability to give “life” to organisations, products and therefore supply chains. Sustainability ensures continued *existence, survival* and *growth*. It does so partly through its approach to products whose *lives* are extended before an end-of-life state is supported by *recovery* processes.

Table 7 – sample of MLEs illustrating SUSTAINABILITY-SUPPLY CHAIN RELATIONSHIP is LIFE-GIVING

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| <ol style="list-style-type: none"> 1. “What is it that we need to do, not just to <i>survive</i> but to <i>thrive</i>...?” (C&E2011) 2. “the ability of one or more entities to <i>exist</i> and <i>flourish</i>...”(C&R2008) 3. “Allow an organisation to achieve long-term economic <i>viability</i>” (C&R2008) 4. “not only stay in business but that they do so in a manner that allows them to <i>thrive</i>, reinvest, innovate and <i>grow</i>” (P&W2009) |
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SUSTAINABILITY is a PHYSICAL FORCE

Sustainability-related events in the macro-environment, such as changes in policy or legal trends have the effect of *forcing* change and applying *pressure*. Sustainability is seen to have *impact* on traditional practice. The nature of this impact is suggested through MLEs which suggest a high level of affect based on images of speed and strength as consequences of the application of physical force: organisations are adopting considerations of sustainability *rapidly*, alongside illustration of the sustainability context through the *rapid* rise in oil prices (Carter and Rogers, 2008). Meanwhile macro environmental changes thus require organisations to *tightly* change existing practices (Linton et al., 2007).

Table 8 – sample of MLEs illustrating SUSTAINABILITY is a PHYSICAL FORCE

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| <ol style="list-style-type: none"> 1. “Current legal trends will <i>force</i> many of those changes (L2007) 2. “brand owning companies...are likely to come under <i>pressure</i>” (S&M2008) 3. “... consider the implications and <i>impacts</i> of sustainability on traditional assumptions” (L2007) 4. “growing environmental concerns...have included <i>rapid</i> substantive changes” (L2007) |
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With regards to its relationship to supply chain management, sustainability is a PHYSICAL FORCE is seen to have the effect of changing the physical shape of supply chain management – it *stretches* and *extends* supply chain management and its associated concepts.

Table 9 – sample of MLEs illustrating SUSTAINABILITY-SUPPLY CHAIN RELATIONSHIP is PHYSICAL CHANGE

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| <ol style="list-style-type: none"> 1. “Sustainability <i>stretches</i> the concept of supply chain management” (L2007) 2. “supply chains must be explicitly <i>extended</i> to include by-products of the supply chain”(L2007) 3. “The first theme in the literature is an attempt to <i>extend</i> what we already know about supply chain management in general in to the realm of sustainability” (P&W2009) |
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SUSTAINABILITY is a PHYSICAL OBJECT

Sustainability is something that can be *viewed* and *observed*, even if those who have looked upon it have done so from different *viewpoints* and *perspectives* – for example *seeing* sustainability variously as “interdisciplinary” (Linton et al., 2007) or as “environmental management” (Carter and Rogers 2008). These MLEs align with Lakoff and Johnson’s

(1980) proposed conceptual metaphor that SEEING is UNDERSTANDING. However, as such a “thing”, sustainability is thus something that can be picked up, and experimentally “*position*[ed]...within the broader rubric of SSCM” (Carter and Rogers, 2008). At the same time, other MLEs cast sustainability in terms of large physicality – an *area* of land, a *field* of study, or an *arena* which can be characterised as having an ontological and spatial *whole* with measurable *dimensions* which might be considered *broad*, relatively *wider* than corresponding concepts or the concept of “supply chain” itself, and with a spatial orientation that puts the triple bottom line concept at its *core*.

Table 10 - sample of MLEs illustrating SUSTAINABILITY is a PHYSICAL OBJECT

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| <ol style="list-style-type: none"> 1. “Supply chain managers appear to <i>view</i> sustainability primarily as environmental management...”(C&R2008) 2. “...<i>position</i> sustainability within the broader rubric of SSCM” (C&R2008) 3. “...taking in to account the environmental and social <i>dimensions</i> of sustainability” (S&M2008) 4. “these facets of sustainability and the <i>core</i>, triple bottom line framework” (C&R2008) |
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More specifically within the higher order construct of sustainability as a physical object, sustainability is sparsely but variously cast as STRUCTURE with *foundations*, *frameworks*, *supports*, and *building blocks* which together construct the concept, and for Carter and Rogers (2008) enable sustainability as a CONTAINER which “*includes* multiple activities.” In its relationship with supply chain, we propose the conceptual metaphor of SUSTAINABLE -SUPPLY CHAIN RELATIONSHIP as STRUCTURAL whereby the dimensions of sustainability and supply chain management are combined in the co-construction of the sustainable supply chain.

Table 11 - sample of MLEs illustrating SUSTAINABILITY-SUPPLY CHAIN RELATIONSHIP as STRUCTURAL

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| <ol style="list-style-type: none"> 1. “Existing best practices as a <i>foundation</i> for sustainability” (P&W2009) 2. “a supply chain that performs well on traditional operational metrics is a <i>foundation</i> of a sustainable supply chain” (P&W2009) 3. “Other <i>constructs</i> could be included as <i>supporting facets</i> of sustainability, no other <i>constructs</i> appeared as consistently in the extant literature or in company sustainability reports” (C&R2008) 4. “high ethical standards and expectations” (a <i>building block</i> for SSCM)” (C&E2011) |
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SUSTAINABILITY is a PERSON

MLEs hailing from sociological source domains also occur frequently across the sample of SSC discourse, notably drawing on source domains of both protection/support and human beings in the form of the personification of sustainability. From this we infer the conceptual metaphors of sustainability is a WARD OF THE ORGANISATION and sustainability is an AUTHORITATIVE GUARDIAN. As a ward of the organisation, sustainability is a vulnerable and *infant* entity which is *adopted*, *aided*, *helped*. It is a source of *concern* and thus afforded *treatment*. The needs of sustainability are such that it requires agreed *commitment* of collective *responsibility*.

Table 12 – sample of MLEs illustrating SUSTAINABILITY as WARD OF THE ORGANISATION

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| <ol style="list-style-type: none"> 1. “We identified practices, programs and policies that ...<i>aided</i> sustainability (P&W2009) 2. “Increasing <i>concerns</i> over sustainability” (L2007) 3. “<i>Treatment</i> of sustainability issues” (S&M2008) 4. “The person with <i>responsibility</i> for sustainability” (P&W2009) |
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By contrast, the findings of the systematic metaphoric analysis suggest that sustainability is also cast in the role of an AUTHORITATIVE GUARDIAN figure, which, upon *entering* “the popular culture” (Linton et al., 2007) now lays down *requirements*, *offers* opportunities and grants permission of organisations and supply chains.

Table 13 – sample of MLEs illustrating SUSTAINABILITY as AUTHORITATIVE GUARDIAN

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| <ol style="list-style-type: none"> 1. “... new/novel collaborative processes <i>required</i> by sustainability” (P&W2009) 2. “the existence and flourishing of other collectivities of entities is <i>permitted</i> at related levels” (C&R2008) 3. “Criteria that <i>allow</i> an organisation to achieve...” (C&R2008) 4. “the triple bottom line explicitly <i>directs</i> managers to identify...” (C&E2011) |
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Discussion

The findings of our analysis suggest the existence of a range of metaphors in academic discourse on sustainable supply chains. We have not sought to suggest the existence of a single overarching metaphor in the field but rather to recognise the complementarity of different conceptual metaphors in order to promote discussion of the potential impact of such. Such complementarity leads us to suggest that dominant conceptual metaphors in SSC discourse have the potential to affect academic reasoning in terms of the extent of change required in ‘supply chain management’ for the achievement of a sustainable world (c.f. Pagell and Wu, 2009). The “thingification” (Andriessen, 2006) of the concept of sustainability in our findings gives it an ontological status which symbolically compartmentalises the issue and externalises the locus of concern, and therefore action, beyond the supply chain. Simultaneously it seems sympathetic to a suggestion that “sustainability” can be retro-fitted in to a pre-existing supply chain machine. While Pagell and Wu (2009) and Carter and Rogers (2008) explicitly emphasise the need for “integration” of sustainability in the broader machine, we question to what extent current MLEs enable recognition that this may require fundamental rather than piecemeal change (Hopwood et al., 2005). Indeed, the journey metaphor has been critiqued in wider literature on similar terms: Milne et al. (2016) critically suggested that its use in corporate discourse projects an image of change in order to maintain the status quo. Playing a major role in the consumption of natural resources and production of waste, supply chains offer a significant site of action for the achievement of a sustainable world (Matthews et al., 2016) but specific entailments of the journey metaphor suggest that the emergence of SSC in its current form already constitutes progress towards sustainability. This enabled Linton et al. (2007) to conceptualise their focus as being on “the convergence of sustainability and supply chains”, and Carter and Easton (2011) to conceptualise the findings of their literature review in terms of a positive image of progress from disparate to consolidated perspectives on sustainability as a foundation for future supply chain research. They identified “a convergence of perspectives as the TBL” on the assumption that forward progress on a consolidated path is positive. In fact, recent work has questioned the sustainability of sustainable supply chain

activities (Matthews et al., 2016), while there simultaneously remains broader suggestion that “sustainability” is an essentially contested concept (Connelly, 2007; Hopwood et al., 2005).

Central to the challenge of determining “sustainability” is the means versus ends debate (Sen, 2013) which encourages us to ask the question, *what are sustainable supply chains for?* Dominant conceptual metaphors in SSC discourse seem to tend towards a prioritisation of the question of *how do we make supply chains sustainable?* rather than *how do we manage supply chains for sustainability?* This is evidenced by the framing of sustainability as an organism which gives life to supply chains and furthers recent suggestions that the focus of SC research has been on making supply chains less unsustainable rather than making supply chains truly sustainable (Pagell and Shevchenko, 2014; Markman and Krause, 2016). SUSTAINABILITY as ORGANISM arguably enables economically dominant reasoning in ascribing supply chains an entitative existence (Barter and Russell, 2013) which are buoyed by sustainability, thus potentially driving such economically driven research interests as the economic impact of green/sustainable initiatives. Thus, examples of “sustainable” practices in SCM offered by Carter and Rogers (2008) were internal to the chain, and did not explicitly reflect upon the external improvements regarding development or freedom (Sen, 2013) for multi-variate stakeholders (human and non-human, future and present), that are at the heart of the sustainability agenda (WCED, 1987).

The present pilot study precedes a larger, systematic and longitudinal analysis of academic discourse on SSCs to further investigate the findings and suggestions made above. Nonetheless, we tentatively propose the need to attend more squarely questions of the responsibility of business, for whom “supply chain management” is an incumbent economic servant (Mentzer et al., 2001; Burgess et al., 2006). An attendant shift in terminology away from the use of “sustainable” as an adjective to supply chain management will perhaps complement a shift in the conceptualisation of the sustainability-supply chain relationship from sustainability as sustaining chains, towards supply chains as sustaining the planet (Banerjee, 2003). This is congruent with recent calls for ecological supply chain management (Nieuwenhuis and Touboulic, 2017; Montabon et al., 2016). For this, however, we propose that alternative metaphors may be necessary. We thus intend our future research to ask the question, *what (new?) metaphors are most helpful for us to conceptualise supply chains in a sustainable world?*

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