ABSTRACT

This paper argues that there have not been many recent studies that looked at the impact of cognition, and especially framing, in supply chains. While some studies cover the behavioral aspects of supply chains, we argue that these studies do not uncover the necessary thinking patterns used by managers in this field. In particular, nobody has studied how managers of supply chains maintain agility in complex managerial environments. We therefore argue that this is an area that needs development in supply chain management. We develop several research propositions around organizational aspects of framing in order to develop further research into this area. Our paper aims to fill a gap found in existing literature reviews and adds the dimension of managerial cognition to supply chain management research. It is believed this will lead to better insights into the management of supply chains.

Key Words: framing, cognition, agility, supply chain management
INTRODUCTION

In a recent review of agility in the Supply Chain Management literature, [23] coordination and cooperation capabilities were suggested to be factors that influence operational agility. A concern to the researchers was the way in which studies highlighted the ability of supply chain managers to coordinate and cooperate as part of managing a supply chain. They highlighted the ‘cognitive limitations’ of agility because of the moderating effect of communication on agile operations. That is, the authors argued that existing research into agility relies on the assumption that coordination and cooperation are controlled by the cognition of managers to organise themselves in such a way that these operations are possible. Recently, the role of culture [43], technology [1], the role of ‘information availability’ [12] and knowledge management [28] are areas that have been identified as being important to agile supply chains (henceforth ASC). This research suggests that ‘coordination’ problems are linked to cognitive limitations (see also [27] for example) of parties.

Other researchers for example [7, 33, 48] centre around the idea that cognition plays an important role in determining these relationships in the broader sense of organising strategy, operational efficiency and competition in low-margin/high competition environments [13, 15, 16, 28]. In other words, according to Gligor and Holcomb [1] managerial cognition plays a role in determining the effectiveness of coordinating and cooperation in supply chains. Yet, this has not been clearly established in the literature. These assumptions are built into the literature tacitly but have not been explored in any great depth as they relate to ASCs. While it has been established that cognition plays a role in supply chain management, very few studies have focused on the ‘agile’ (see for Christopher and Holweg [16]).

In this paper we propose that a great deal could be learned by extending the cognitive ideas of the broader literature to the specific problem of agility. This is because agility is a special case for supply chains that draws on the need to adapt and move fast to keep up with turbulent market demands. Christopher and Holweg [12] argue that an agile supply chain is one that is flexible, dynamic and robust enough to adapt to any turbulent market conditions. This differentiates this study as it seeks to focus purely on the modern ‘agile’ supply chain. While researchers have studied cognition in supply chains, we argue that a more focused approach is required for supply chain management. One that draws on the particular habits of agile supply chain managers and how they frame and enact daily problem solving. We argue that a supply chain that is focused on agile values is likely to be different from those that are not.

We introduce the idea of ‘frames’ from social movement theory as a way of beginning to understand how agile supply chain managers think. The point of using this theory is that in sociology it is well established in the exploration of how people organise themselves around core ideas. Given that agility is a way of acting based on a set of cognitive principles, we believe that social movement theory and in particular frame analysis, are established tools used to study how people organise themselves in social environments. Instead of inventing new tools, we propose using these ideas to explore the ASC context. To begin this discussion we explore: what framing is, how it’s been
applied and then argue for a way it could be applied to ASC. We conclude our paper with three research propositions to take these ideas forward.

**WHAT IS FRAMING?**

Framing has a long and contested history [39]. Definitions of what is meant by framing vary across disciplines such as: media studies [17], social psychology [14] and cognitive psychology [30] for example. Scheff, [6] points out that in sociological circles framing has become impossible to define. He defines framing as the assemblage of context and meaning through the rhetorical devices of communication and action [p.82]. In words, a frame is taken to be the interpretive schema used to inform the actions we take. According to Scheff, [6] a frame is not just a cognitive category or a substitute for thinking about context, it is the organising of context itself. Put another way, Scheff [6], defines framing as recursive structures of mutual awareness based on the interaction of cognition and action. These structures are the products of humans assembling a context that links the cognitive aspects of framing tightly with action. Framing involves the context of a long history of cultural significance [4] that evolves and resonates with those that assemble the frame. Framing therefore is the intersubjective construction of context, organising and experience, through historical, cultural and socio-psychological lenses. Snow et al. [42] define framing as a ‘schemata of interpretation’ that allows actors to organise, label and find meaning in every day life. Snow et al. [42] see a frame not as an isolated cognitive element but is the guiding heuristics for organising, justifying and taking action. For ASC these are the underlying interpretive schemas used to guide action.

Individuals and groups organize their experience of a situation by shuffling through their vocabularies of words, phrases and propositions, and images, acting as if they are joining the components of simple verbal operators, so that the situation becomes meaningful for them [6]. An example offered in [8] is the way in which people frame unidentified flying objects (UFOs) as alien invaders. He argues that faced with something unknown, most people will create a meaning that makes enough sense to be plausible. Goffman [15] points out that the frame, as a basis of meaning generation and a guideline for the interpretation and organising of events, is primarily an interpretative schema or a guideline for structuring thought. Put simply, the frame in this case is the organisation of ambiguity into a label that makes sense (see also [49]) because it’s a useful thing to have. While individual framing is important for sociology we argue that insights into supply chain agility can be gained by studying the social movement side of framing that we introduce below.

**Social Movements and Framing**

In social movement theory, framing has been used primarily to understand how groups take ideas on board and create observable action from them. The frame in this case is not usually some ambiguity looking to be made sense of, it is a core set of notions that people believe is worth acting on. A highly cited version of framing and social movements can be found in a study on the framing of disputes in nuclear disarmament [6]. In this study Benford demonstrates how actors mobilise around frames of a problem. Consequently these actors form groups with different frames of how the movement
against nuclear disarmament should be lead. Of interest to this paper is this idea that a social movement, such as a Nuclear protest movement, can be observed by watching how people interact. Benford shows how the core beliefs of the movement were at first aligned, then as alternative framings of the situation emerged, actors began to fight for alternative versions of movement participation and direction thus leading to factions and new ideas about how to form groups about nuclear disarmament. The point is that framing, the cognitive act of organising, labelling and justifying interpretative schema drove discord through the nuclear disarmament movement.

A related idea in social movement theory is frame resonance. Frame resonance is the collective action of people who agree or ‘resonate’ with an established social way of understanding (called a primary framework by Goffman). Frame resonance is used by authors [6] to describe how actors mobilise into action forming groups once they agree with a set of ideas (i.e. what actions they deem to be appropriate). As actors create meaning from the problem, they organise a context for action based on their core values and beliefs. Benford and Snow [5] highlight three important factors for frame resonance: Consistency of message, evidence supporting the message and credibility in the ‘claimsmakers’ [p.619]. Frame resonance can be thought of as part of the narratives in an organisation because it has to be something that is meaningful to actors [37]. This can be extended to how salient the frame is. For example, is it central to the experience of the target group, does it resonate with the lived experience of people and does it have “narrative fidelity” [does the story hold together - see Benford & Snow [5],[22]] or does it resonate culturally. Goffman [15] also argued that the more experience we derive from framing our experiences the more we believe them and the more likely it will be that we will act on them (p.621).

In the framing literature the idea of frame resonance describes the outcome of that process. A resonance of frame occurs when actors have identified ideas of significance, adopted them and there are measurable actions that demonstrate the use of these frames. The resonance of a frame is often found in groups of people that are perhaps attending a social group, taking actions based on clearly identified values, identifying themselves with a cause such as animal welfare or sustainability or a group people who share ideas in common (enough) to be taking actions around those ideas. Resonance takes the assumption that if enough actors believe an idea is worth pursuing then an outcome of that will be the processes of social action leading to group formation and actions. When considering supply chain agility there are some interesting connections that need to be explored.

**LINKING FRAMING AND SUPPLY CHAIN ‘AGILITY’: A RESEARCH PROPOSAL**

Supply chain agility is an area that has attracted a lot of debate. Some authors [29] note that an agile network is built on several key assumptions. Primarily they argue that agility is a broad umbrella term describing the capability of a supply chain to ‘adapt’ to market conditions and to be flexible enough to remain functional. Between these various definitions agility is seen as the acquiring and development of capabilities to match
shifting market conditions and the capacity to respond and adapt to conditions continually [see also Christopher and Holweg [12]]. Swafford, Ghosh and Murthy [44] argue that an agile enterprise is one that moves and changes at a rapid pace, is adaptable in light of market turbulence and is responsive to external changes. Agility refers to the ability of a supply chain therefore to adapt quickly and responsively to disruptions. That is, an agile supply chain, ‘...enables an organization to react quickly and more effectively to marketplace volatility and other uncertainties, thereby allowing the firm to establish a superior competitive position (p.171).’ Agility is therefore the capability, of a supply chain, to change quickly to dynamically changing external situations.

The market turbulence of 2008 until now provides a case in point. Christopher and Holweg [16] note that ‘turbulence’ is now a normal part of life for many businesses. A supply chain therefore must be equally as responsive, flexible and adaptable if it is to respond to market conditions. There are several important factors to consider in ASC. Some authors [46] for example, highlight cost reduction, just in time management strategies for lean manufacturing, cross functionality, training, improved goal setting, customer satisfaction and strategic alignment as key issues for ensuring supply chain management success. This kind of thinking has arguably been drawn from Porterian concepts of competition. However, a hint is offered as to what agility could really be about in Baramichai and Marangos [2] who argue that agility is about ‘configuring’ supply chains by understanding relationships and finding the ‘right’ approach. This also requires an understanding of the role ‘partners’ play in developing the business relationship.

Gligor and Holcomb [23] reviewed the literature surrounding agile supply chains to find that coordination and cooperation capabilities are important elements of agility:

“This (problems in coordinating supply chains) is due to the fact that cooperation problems are rooted in motivation, while coordination problems are due to cognitive limitations of parties. These limitations deny parties the comprehensive knowledge of how others will behave in situations of interdependence, and how they will act interdependent with others. For that reason it is proposed that coordination has a moderating effect on the degree to which firm-specific logistics capabilities become integrated supply chain logistics capabilities [p.447]”

The authors don’t explain what those cognitive limitations are and there is very little research offered in the area of agility to further investigate this. One argument offered by framing literature is the idea of frame diffusion. A diffused frame is where a common set of shared beliefs, diffuse or become part of a social movement. That is, actions arise from the beliefs and actors themselves live out their lives and activities in accordance to those beliefs. A core idea of this is the formation of a shared understanding of purpose and the active projection of ideas across a social setting by ‘agents’ who work within the culture to reinforce ideas to be ‘diffused’ [5]. These authors talk about two discreet framing processes:

1. Strategic Selection and fitting: where an active agent facilitates the joining of frames by actively working in the culture to adapt or move them through their existing frame to a new interpretation. They call this ‘adapting’ of the borrowed item into the new host or
culture [p.627]. This is an intentional activity where an agent is engaged in fitting the desired shift into the culture in question.

2. Accommodation: In this case, “the transmitter (is) actively engages in tailoring and fitting the objects or practices of diffusion to the host culture [p.627].” This is similar to sensegiving in that carries the same implications of rhetoric [21] because through consistent messages frames take hold. The level of rhetoric, soft power and other issues involved in this also contribute to how well a set of ideas is received [3].

Arguably, frame diffusion is a necessity for effective organising. Without widespread acceptance of managerial ideas, such as process driven strategy or agility, there is little chance that ideas will be adopted. As Cornelissen et al. [17] note, there is a dynamism between the way in which people adopt and use ideas and the role of those that put forward the ideas for adoption. It is not so neatly explained as a linear process where people fall in line. There are power relationships, structures of accountability and other organisational realities that create the environment for ASC. For the agile network, we argue, this dynamism is often understated in existing research or completely ignored.

Framing plays a large role in the way supply chains cognitively organise themselves, yet there is little research in the agile supply chain literature that demonstrates this. One example is found in the concepts of supply chain responsiveness [51]. Typically the focus is on mathematical algorithms [20], process flexibility [26], aligning competitive priorities [47], optimisation [41], risk management [9] and a standing argument on agile versus lean [14]. In the majority of the literature there is a hint that cognition plays a role (see for example [23]). We propose that by using the ideas of framing better insights might be gained. The following broad research question is offered to facilitate this study:

1. How do ASC managers cognitively organise their context in order to maintain agility?

Supply chains must remain flexible in order to be agile [27]. This is in spite of market conditions [16] and the modern dynamic context of supply chains. Put simply, we are interested in learning what kind of mindset is needed to keep a supply chain agile. We argue that framing, and by way of extension frame analysis, as way of understanding how individuals cognitively organise their context, offers a unique way of finding out about how managers think and organise themselves. Previous studies in the general and strategic management literature have yielded interesting insights into problems. For example, Kaplan [32] studied the role of framing in determining organisational strategy. In this study she found that managers would engage in political contests and use power games to gain the upperhand in the boardroom. The benefit of studying framing from this point of view is that links the idea of thought and action to context. Previous studies on agility support the idea that coordination and cooperation relate to the cognitive capacity of managers in supply chains [23]. The function of organising however, is often linked to market concerns rather than the behavioural aspects of supply chains. There is room here to explore the ideas of sensemaking [49], framing and other types of organisational theory as they relate to the specific agile context. The majority of the literature has ignored this to date.
This is problematic because the focus tends driven by assumptions about how supply chains relate to markets [34, 35, 46] as opposed to the problem of how internal organisational supply chains organise themselves in response to market turbulence. We propose that by studying how supply chain managers organise their work, we can begin to understand the coordination and organising function in ASC. Therefore our second research proposal is:

2. What kind of frames do these managers use to guide their actions in the ASC context?

By studying frames used for decision making in the ASC context we believe great insights can be gained about how agility actually works (Squire et al. [40]). Those that work with managers in such an environment have a very different set of conditions to draw from as noted in recent research [28, 40, 45, 50]. By uncovering these frames we can begin to unpack the internal context of ASC and learn more about the role of cognition in ASC. These broad conceptual concerns are represented in the diagram below:

![Diagram](image)

Figure 1 - Basic conceptual of cognition and framing information agile supply chain management.

To summarise our argument thus far, we argue that the cognition underpinning a work environment is informed by frames for thinking about that environment. We are suggesting that this needs to be explored in SCM from the point of view of how managers organise themselves. The following question therefore tackles how we can address this methodologically.

3. What are appropriate methodologies to use in exploring framing in agility?

Previous management studies have used mainly qualitative methodologies. Kaplan [32] uses ethnography to study the behaviour of executives engaging in framing strategic decisions. In the intervening period since Benford and Snow [14] frame analysis as a technique has seen widespread usage in media studies [8] which has caused some debate about how useful it may be [19]. That is, it has grown to be a useful tool for the analysis of rhetoric in a wide range of research programs [10, 17, 36]. As it relates to agility we wish to use the concept in the same manner as Snow et al. [42] because instead of focusing on managerial rhetoric, we believe the best approach would be to look at framing, as it relates to agility, through the lens of mobilisation. That is, what kind of
methodology would allow us to study agility through the lens of collective mobilisation, cognitive alliances and to encompass the diffusion of important ideas/frames around the networks?

Ideas such as Goodman’s linkage analysis [25] would allow an examination of an organisation across hierarchies and departments from a socio-technical point of view. Social network analysis [38], ethnography [31], theory building case studies (e.g. Eisenhardt and Graebner [18]) are possibilities for exploring the agile context and should be considered as well. We would argue that any kind of reductionist approach would not capture the flow of framing as it moved around the supply chain. Also, there is a plethora of quantitative studies drawn from a positivist tradition in supply chain management research, that whilst suitable for their area, are not adequate for multi-level cognitive studies [11]. In this way, a qualitative approach can yield insights that could further be explored through exploratory factor analysis.

To further explore these issues requires that we isolate and single out what kinds of thinking patterns, called ‘frames’ in this paper, that are useful for the ASC context. These insights will be useful for both research and teaching purposes. Firstly, not much is known about how thinking influences and shapes agile supply chains. If we could understand the core frames used, we could better plan and forecast in agile supply chains. As scholars we often refer to ‘agile networks’ without really explaining what role cognition plays in coordinating them. By understanding this further, we may gain insights to help explain the kind of thinking that underpins the ASC context. This would enhance our teaching practice. To explore this we need to investigate in more detail the frames that underpin ASC in order to teach the principles of agility more clearly.

CONCLUSION

In this paper we have argued that there is a distinct lack of research in understanding how ASC organise their context. We argued that in addressing this gap we need to explore the context of ASC through frame analysis, or a related methodology, to find out the key ideas used in the agile context. Secondly, we argued that existing research is broad in orientation and overlooks the agile context. In order to address this gap we called for research to explore framing in the ASC context. It is believed this research will uncover new insights about ASC and the way in which they are managed.
REFERENCES


