

# Conceptualising Dyadic Inter-Organisational Relationships as Complex Adaptive Systems

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## Abstract

There is a long tradition of research that recognises that business relations occur within complex systems. Network theory recognises the embedded nature of actor relations; it acknowledges their dynamic and emergent qualities, and foregrounds the co-existence of continuity and change over time (Thorelli 1986; Håkansson and Snehota 1990; Easton 1992; Dubois et al. 2003). Research within this tradition has been underway for nearly two decades and has been largely responsible for the shift in focus from dyadic exchange to exchange between organisational actors within networks (Håkansson and Snehota 1990; Cheung and Turnbull 1998). Despite the recognition here and elsewhere that complexity has much to offer in understanding interaction, relationships and networks, the majority of work to date has focused primarily upon the network. While this is, of course, very interesting, it ignores the possibilities of understanding the dyad as a complex adaptive system in its own right. This paper will show however, that research at the level of the dyad has suffered as a result of the popularity of network theory and also because of the axiomatic reliance on deterministic theories and framework. We suggest that despite the recognition of complexity at the level of the network, the dyad continues to be treated as a fairly simple system and emerging insights from the network approach have not generally been incorporated. While this may be implicitly acknowledged within network research, it has rarely been explored in any detail. To redress this issue, this paper elucidates the possibilities of using complexity theory, a theoretical frame being brought to bear on understanding business networks is complexity theory (Easton et al. 1997; Wilkinson and Young 2003) to the understanding and explaining of patterns of interaction and change within dyads. Moreover, critical realism, already acknowledged as being particularly apposite in network studies (Easton 2000), is brought to bear to aid in the explanation of dyadic relationship development. This position foregrounds the search for the structural conditions and generative mechanisms to explain the nature of the relationship and its development over time. The mobilisation of this position is facilitated by a processual case study design, the nature of which will be outlined in detail.

**Keywords:** complexity theory, critical realism, processual research design.

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## Introduction

Dyadic research has a long tradition within business research and, indeed, pre-dates network research by some years. According to Wilson (1995) research in this area can be delineated between construct, concept and process level research. Research at the level of concept describes and explores the very notion of interaction and offers models to capture this (e.g. Håkansson 1982). This particularly characterises the early IMP work on understanding interaction mechanisms and their impact upon relationship structure and development. Construct level research has focused on identifying and understanding those constructs that explain and predict relationship success. This type of research has been popular outside of the IMP group and has been largely positivistic in nature (c.f. Morgan and Hunt 1994). As a result, the emphasis has been on antecedents and consequences and has been largely deterministic in its conceptualisation. Process level research attempts to capture the development of relationships over time and generally employ life-cycle models in this endeavour. The most popular models assume that relationships progress over time through a number of stages which despite being labelled differently generally reflect the same activities and processes (Wilson 1995). While both concept and construct level research has evolved continually, critiques suggest that research in the area of dyadic relationship development has not moved far beyond those models that dominate the discourse (Hedaa 1991; Dabholkar et al. 1994; Halinen and Törnroos 1995). The most commonly cited of these include: Ford (1980); Frazier (1983); Dwyer et al (1987); and Wilson (1995). While this work has importantly deepened our understanding beyond the relationships between relationship success variables, a number of limitations to the relationship development literature remain. These limitations stem from the overarching deterministic frame employed in such models, which limits our understanding of the complex nature of relationships to a set of discreet developmental stages (Ford and Håkansson 2006). From this perspective change is considered imminent where a developing entity is moved along given points by an underlying logic or code which regulates the process of change (Halinen and Törnroos 1995). Moreover, while the process is open to external influencing factors, the stages themselves remain fixed (Van de Ven and Poole 1995). Within this reasoning, it is suggested that certain progression of events must occur before movement to the next stage is possible. For example, one cannot move from birth to death without experiencing some intermediate state(s). This perspective essentially limits organisational agency and therefore cannot capture the nuanced lived experience of relationships as they evolve in differing trajectories, driven by contextual contingencies (Wilkinson and Young 1994).

*“There is clearly a logical gap between the underlying processual assumption and the used methodology. This incongruence may explain the relatively modest progress of process models in buyer-seller interaction during the past decade (Halinen and Törnroos 1995:508).*

While it is therefore clearly recognised that capturing process is extremely important to understand relationships and networks, our methodological tools remain insufficient to effectively capture this within our research (Ford and Håkansson 2006). There is therefore an implicit recognition that in order to enhance sensemaking at the level of the dyad, new theories and methodologies are required. This paper argues that a number of theories and methods already familiar to IMP researchers, but not currently brought to bear on the dyad, offer exciting possibilities. To this end, this paper critiques dyadic level research for its inability to capture the full complexity of this unit of analysis through both the theories and methods that dominate this work. Furthermore, whilst acknowledging the important advances in understanding made as a result of network level analysis, the failure to acknowledge the centrality of the dyad is put forward as hindering the full possibilities of these research streams. Thus, the initial failures of dyadic research have not so much been overcome through a focus on the network, but rather, have been sidestepped. There is, therefore, an immediate need to refocus research attention on the dyad in order to understand both the dyad itself as well as its impact on the network. Moreover, while the paper acknowledges the limitations of current theories and models in this regard, it argues that when the dyad is appropriately considered a complex system in its own right, that the theories and models currently popular at the level of the network become increasingly apposite.

Because the majority of dyadic level research has been concerned with understanding how relationships are initiated, developed and maintained (Wilson 1995) the paper begins by a critical review of this research stream. Next, the paper articulates how recognition of the limitations of this research stream has resulted in a move from the study of single dyadic relationships to interdependent actors within networks. In doing so, the paper introduces a number of theoretical and methodological lenses which have been brought to bear in order to capture what is clearly a complex phenomenon. According to Ford and Håkansson (2006), certain key issues continue to confound our understanding of inter-organisational relationships and their development, that is: their operation within open systems context; the growing interdependencies and interconnectedness, which lead to emergent dynamic behaviour; and the notion of time. The recency of this observation makes clear that the methodological perspectives and tools required, to both capture and explain, the development of inter-organisational relationships which excide such characteristics remains to be identified. On this basis, the paper calls for the use of theories and methodologies capable of capturing such complexity to be employed at the level of the dyad. These include complexity theory (i.e. ontological position), critical realism (i.e. epistemological position), and processual case study research design (i.e. apposite methodology). A discussion of these thus forms the main body of this paper, which importantly includes the presentation of the logic used in delineating the dyad as a complex, adaptive system in its own right.

## Models of Relationship Development

The indeterminate, emergent and dynamic aspects of relationships are well recognised within the extant literature and forms a core principle in the work of the IMP (Ford et al. 1986; Håkansson and Snehota 1998; Saren and Tzokas 1998). Thus, there has been a long-term focus on how relationships are initiated, developed and are sometimes dissolved (O'Malley et al. 1997). However, when relationship development becomes the central focus of research, there is a tendency to resort to the life-cycle based deterministic models that are the received view (c.f. Möller and Wilson 1995:34). This is despite the fact that the conceptualisation of relationship development within a deterministic life-cycle frame has been recognised as problematic (Dabholkar et al. 1994; Ford and Håkansson 2006). A central reason for this is the prevalence of the concept of life cycle in our everyday thinking (e.g. birth, life, death etc). This viewpoint is echoed the mainstream marketing discourse, where references to product, market, and industry life cycles are commonplace. This has meant that conceptualising relationship development outside of this frame has remained difficult, which has led to a mere incremental development of our understanding of how relationships evolve over time (Halinen and Törnroos 1995).

*"In a turbulent world it is very unlikely that so many influence factors work in concert to support the life-cycle notion of consecutive stages" (Hedaa 1993: 191)*

While current process models present relational development as a series of discrete stages, it is generally accepted that, in reality, exchange relationships are more likely to be characterised by wigwag movements of strengthening and weakening forces, maybe even with intermittent disconnections, impacting the dynamics and quality of relationships (Hedaa, 1991). Ford and Rosson (1982) who see relationships as being growing, static or inert throughout its lifetime, share this conceptualisation of relationship development. Notwithstanding these alternative perspectives, the life-cycle conceptualisation remains the dominant form of delineating stages in the progression of relationships over time and has subsequently dominated our understanding of the *nature of change* in relationships.

*"Relationships always have a time dimension, and thus a future that is uncertain and a history whose interpretations and memories are subjective. Relationships are thus undetermined; their meaning to those involved is changing over time and their development depends on how the parties interpret and re-interpret different acts" (Håkansson and Snehota 1998: 18)*

There is increasing recognition that research at the level of the dyad has not fulfilled its promise and a number of new research avenues are being pursued. A number of insights that emerge include:

- An individual dyad may involve multiple points of interaction, encompassing different dimensions of both organisations (Holmlund 2004), and possibly involving different actors.

In this sense, the dyad is a complex system in its own right. Thus, while on a simple level the dyad is composed of two actors, in reality, this may involve multiple interactions between many people and these interactions occur within a culture influenced by time, history, expectations etc.

- All dyadic relationships are subject to temporal influences and thus, where possible, understanding of the relationships over time is necessary. Although there have been extensive calls for longitudinal data (Halinen and Törnroos 1995), conceptualisation of temporality has, for the most part been limited to a reliance on notions of a life-cycle, which as has been discussed above remains problematic.
- Not all dyadic relationships progress through a conventional life-cycle in a linear, sequential fashion (Hedaa 1993) thus, they fail to effectively capture the dynamic nature of relationships over time (Dabholkar et al. 1994).
- The motivation to engage in relationships can vary greatly and include the search for stability, the drive for change, to provide access to resources, to create markets for products (Harris et al. 2003). Even within a single relationship the motivation for a relationship may be very different and individual actors may have diverse views on the desirable rate of relationship development, the range and remit of the relationship, the need for control, the use of power and the relative desirability of stability and change.
- There is increasing recognition that change may be triggered by precipitating or pre-disposing characteristics or events (Halinen and Tähtinen 2000, 2002). This demands greater focus on elucidating upon the dyad in order to understand the underlying mechanisms at work.

These insights have emerged over time, and derive from different research traditions and empirical contexts. Some are the result of critiques of extant knowledge (e.g. Harris et al. 2003) and others from the failure of conventional theories and frameworks to effectively capture the nuances of particular empirical contexts and theories (e.g. Halinen and Tähtinen 2002). However, when considered as a whole, they effectively offer a critique of contemporary theoretical frameworks, and demand that new theories and approaches be considered in dyadic research. Such theories need to be able to *capture* the indeterminate nature of dyadic exchange rather than relying upon outdated notions of determinism.

*“What is needed is a model of relationships that shows evolution without a deterministic view of development. In order to construct such a model, more attention should be paid to the notion of time as well as to the use of longitudinal methods” (Halinen and Törnroos 1995: 506)*

To aid in this, Van de Ven and Poole (1995) suggest that while deterministic models form the received view, they are not the only theory that explains change and development of an entity. Another perspective is the constructivist<sup>1</sup> models of change and development, which include teleological and dialectical theories, which when incorporated into the language and understanding of relationship development, have the potential to be particularly insightful (Halinen 1998). However, moving away from the omnipresent determinism requires more than the incorporation of alternative theories or methods, it requires an alternative ontological and epistemological position, where the dynamic nature of the dyad is conceptualised a priori. The capturing of the complexity of relationships over time requires a methodology that is designed not to “*Untangle [the] weave, but in keeping the tangle and looking at the patterns it produces*” (Goerner 1999: 138). In order to operationalise this we argue that complexity theory has much to offer. Conceptualisation of inter-organisational relationships (at the level of dyad) as dynamic, open, complex, adaptive systems, foregrounds not only their dynamic nature but also offers insights into non-deterministic change and development of the relationship over time.

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<sup>1</sup> The term voluntaristic may also be used here

## Possibilities of Viewing Inter-Organisational Relationships as Complex Dynamic Entities

Complexity theory emerged from biology and systems thinking (Capra 1996) and contrasts strongly with the more mechanistic view of reality, which has long dominated science, and, by definition business. While the mechanistic view foregrounds predictability, linearity and simple causality, complexity theory embraces the indeterminate nature of systems, their dynamic nature and multi-dimensional causality (Capra 1996; Mittleton-Kelly 2003). Complex, adaptive systems have been bestowed with a number of characteristics, which have been seen to operate both within physical systems, i.e. the universe, ecosystems, ant colonies, human body, as well as social systems, i.e. societies, economies, cities, organisations (Goerner 1999). While the differences between human and physical systems remains paramount, the concepts of complex, adaptive systems have offered particularly novel insights into human systems, including organisations, and organisations operating within networks (Kay and Schneider 1994; Brown and Eisenhardt 1997; David 1997; Anderson 1999; Cohen 1999; Lewin and Regine 1999; Lissack 1999; Mendendall et al. 2000; Geersbro and Hedaa 2002; Kruger et al. 2003; Smith 2003; Paraskevas 2005; Woodside and Biemans 2005). Many of these characteristics have already found fertile ground within the extant literature on Inter-organisational relationships, such as, dynamism (Håkansson 1982), embedded nature of systems (Wilkinson and Welch 2004) and the indeterminate nature of relationships (Håkansson and Snehota 1995), etc. Complexity theory therefore seems particularly apposite for network research and has long been influential within the IMP in terms of the language used and the axioms embraced. Recently, a number of authors have explicitly incorporated complexity in their work, for example, Wilkinson (1990) introduces the potential role of complexity theory to help explain complex marketing phenomena. Furthermore Easton et al (1997) examines the recognised self-organising behaviour in network evolution using computer simulations based on NK models, developed by Kaufmann (1993). Wilkinson and Young (2002) develop further the managerial implications of conceptualising networks as DOCAS and suggest that the role of management moves from command and control to that of participation and adaptation. In this regard, complexity theory offers an exciting new methodology that seems capable of capturing and explaining complex interactions between multi-actor and multi-relationship networks.

*"The complexity sciences offer new tools to examine marketing phenomena and to deal with complex marketing problems, as well as new theories of system dynamics and process and the way structures emerge, persist or not, and evolve" (Wilkinson and Young 2003: 180)*

A core feature in the development of complexity science is the recognition of complexity at all levels of analysis, from the universe to the atom. This is counter to the heretofore more prominent Newtonian perspective, which suggested that to understand the whole, it could be broken down into its, more simple, constituent parts, i.e. reductionism. Thus, as Capra (1996:80) argues, rather than these parts being regarded as simpler, when revealed, are actually seen more as "a complex web of relationships between the parts of the whole". Thus, today we are very much aware that even atom is a complex system in its own right (Capra 1976). While IMP researchers have long recognised that the network in which organisations operate is a dynamic open complex adaptive system (DOCAS) (Wilkinson 1990, Easton et al 1997), the same rationale has not been extended to the dyad. Indeed, there is also an argument for the dyad to be recognised as a complex adaptive system in its own right. In this regard, dyadic relationships may involve multiple interaction points; are predicated upon different goals and motivations; are influenced by various histories, resources; politics and other internal/external agendas. Indeed, Holbrook (2003: 26) highlights that "higher levels of nested organisation resemble the lower levels from which they are composed". Moreover, Easton (2002) argues that when two organisations, are necessarily related (as in a relationship), the identity of both becomes mutually constituted, that is, we cannot understand one without the other. In this context both entities form a structure, which is recognised as having emergent powers in its own right, and which according to Tsoukas (2000) cannot therefore be reduced to the powers of it's constituent parts. The relationship formed between the actors therefore, can be seen as an entity in its own right, an emergent structure, made up of two organisations, themselves emergent in nature. We can therefore say, that in taking a complexity theory perspective, that all level of analysis (for example, actor, organisation, dyad, network) can be conceptualised as embedded Complex Adaptive Systems, characterised by interconnectivity, dynamism, emergence, distributed control and so on. However, within this reasoning it is recognised that to understand the network, we cannot simply reduce this level of

analysis to individual dyads that make it up (Easton 1992; Ford and Håkansson 2006). When conceptualising the dyad as a complex adaptive system, we are therefore not attempting to extrapolate insights gained to understand the behaviour of the network. Rather, our intention to understand the dyad as a complex unit of analysis, operating within an *open networked context*. Not only is this important from a research methodology perspective, but also in terms of managerial practice. Within organisations, managers and project teams will be assigned to deal with dyadic or triadic relations and their inter-relationships. Networks on the other hand, as is understood, cannot be managed or controlled by its organisational members (Ritter et al. 2004). So while the sphere of activity remains the network, the sphere of practice, from a managerial perspective, remains at the level of dyadic/triadic inter-organisational relationship. However, the recognition of emergence, dynamism, interconnectivity, etc, brings with it certain difficulties for the researcher in relation to capturing such complexity, without losing the potential richness of this in terms of understanding the development of dyadic relationships. In order to deal with this empirically therefore, it is being posited here that critical realist epistemology has much to offer (Easton 2002).

### **Complex Adaptive Systems within a Critical Realist Epistemological Position**

A Critical Realist epistemological position is well recognised as being particularly apposite within an IMP perspective, due to its ability to capture and explain complex emergent phenomena, which characterise industrial networks (Easton 1998, 2002). Central to the critical realist position is the delineation of reality into three distinct but interrelated levels, that is, the empirical, the actual and the real, as offered by Bhaskar (1978). The value of this view of reality has already been introduced to IMP researchers through the work of Easton (1998). Therefore the intention here is not to restate the critical realist position, but more to delineate those aspects which become important when viewing the dyadic relationship as a complex system, and therefore what critical realism can offer by way of understanding this structure and its development over time.

*"[The three domains of reality incorporates] the real domain, consisting of the processes that generate events, in which generative mechanism or causal powers exist independently with a tendency to produce patterns of observable events under contingent conditions; the actual domain in which patterns of events occur, whether they are observed or not; and the empirical domain, in which experiences may be obtained by direct observation" (Outhwaite 1983: 322).*

These dimensions therefore allow us to see the world as stratified and non-linear "consisting not only of events but objects, including structures, which have powers and liabilities capable of generating events" (Sayer 1992). This three level landscape of reality must be navigated by researchers, where the real domain, whence researchers observe empirical phenomena, becomes a vital starting point and constant reference point, to understand the nature and development of the dyad. The researcher moves beyond this however, in order to understand the nature of the structure of this entity, whereby, generative mechanisms are enacted in context.

Two of the most important characteristics of complex adaptive systems are allowed for within a critical realist epistemology, that is, open systems context, dynamism, and emergent order over time. A fundamental and underlining characteristic of complex systems is *dynamism*, indicating a sense of "life" within any system which emerges, forms and reforms through constant interactions, interconnectivity and interrelationships (Capra 1976, 1996; Mendendall *et al.* 2000). This constant change and concept of non-linearity brings with it a further characteristic of such systems, that is, *sensitive dependence on initial conditions*. Simply put, this relates to the improbability of simple cause and effect, given the level of interconnectivity between any part of a system and the system itself, and that any change in a part of the system, will bring about unpredictable levels of change, or amplifier effects, throughout the system. This is because the higher the degree of interconnectivity, the higher the degree of influence any member of a system will have on the system as a whole (Mendendall et al. 2000; Mitleton-Kelly 2003). One of the most central aspects to systems thinking is the ability of an organism to self organise, correct its own mistakes, and regulate itself. This is done through the generation of feedback loops. "For example, a community that maintains an active network of

communication will learn from its mistakes, because the consequences of a mistake will be spread throughout the network and return to the source along feedback loops", (Capra 1996: 82). The existence of dynamism presupposes that reality operates within open systems, where order emerges over time, and where objects do not exist in isolation, but are inherently relational.

*"Critical realism provides philosophical principles upon which dynamical non-linear characteristics can be understood... [Furthermore] these principles allow knowledge that is socially constructed, and therefore fallible, that represents an understanding of the world in which real mechanisms exist, but which can only be sensed by their effects. For example, the appearance of novel structures and patterns can be explained by a conception of contingent or latent powers inherent in the inter-relationships, rather than by the external imposition of order" (Fuller and Moran 2001: 9)*

According to Outhwaite (1987: 21), realists seek to understand causality in "terms of natures of things and their interactions, their casual powers (and liabilities)". One therefore, searches for structures and the mechanisms by which the nature of entities are brought into being. Unlike the positivist's view of simple causality, a realist analysis "can account for the interactions of various causal tendencies within the complex and open systems among which we live, and which we ourselves are" (Outhwaite 1987: 22). Within Critical Realism objects have certain powers and liabilities accruing to them by nature of their structure. The generative mechanisms of the object exist in relations to these powers and liabilities. The object however is an emergent entity and cannot be understood by considering individual aspects of its structure in isolation. Generative mechanisms are enacted when triggered; however, the outcome of this is contingent on the conditions prevailing (i.e. necessary conditions for the event to occur).

*"A causal statement does not deal with regularities between distinct objects and events (cause and effect), but with what an object is and the things it can do by virtue of its nature. This also entails that objects have the causal power and liabilities they have, independently of any specific pattern of events. The mechanism is not only existent when A leads to B, but also when A does not lead to B; this is the cardinal point in critical realist causal analysis, and has far reaching consequences for social scientific explanations" (Danermark et al. 1997: 55)*

When the entity under study is an inter-organisational relationship, the nature of the relationship emerges from the nature of the two organisations as it is experienced within the relationship, "because objects of social science are relational, they are what they are by virtue of the relationship they enter into with other objects" (Danermark et al. 1997: 45). However while events that emerge are observable and bring about outcomes that are themselves observable, the mechanisms that enacted those powers are neither transparent nor static in nature. That is to say that the two interacting powers may counter each other and so their effect may not be seen (Sayer 1992).

*"Generative mechanisms operate when it is being triggered. Unlike the internal and necessary relation between objects and their causal powers, however, the relation between causal powers or mechanisms and their effects is not determined but external and contingent". (Danermark et al. 1997: 55)*

The critical realist view of causality then, is to understand the causal powers and liabilities of both the emergent relationship, as well as how the intra-organisational powers and liabilities are enacted under certain conditions. According to this then, critical realist causality focuses on the "clarification of structures and their associated generative mechanisms, which have been contingently capable of producing observed phenomena" (Tsoukas 1989: 556). However, in order to successfully operationalise such a position, in methodological terms, a clearer understanding of the role of data collected in terms of dealing with the 'sticky' issues of inter-organisational relationships must be made clear. These issues will now be discussed in more detail in relation to those key aspects of inter-organisational relationship research methodology that have been identified as requiring attention (Ford and Håkansson 2006), that is, their operation within open systems context; the growing interdependencies

and interconnectedness, which lead to emergent dynamic behaviour; and the notion of time. This will be achieved by exploring the notion of processual case study research design, an approach which has been developed specifically to maintain the richness of complex phenomena, while still being able to reach clear conclusions as to the causal conditions to explain their development.

## **Operationalising Critical Realism at the Level of the Dyad: the role of processual research design**

Processual case research, as a research design, has been developed by a number of authors within the management literature, namely Van de Ven (1987, 1990, 1995) and Pettigrew (1997). This particular research design has also proved insightful within studies incorporating an IMP perspective (e.g. Halinen 1997). Most importantly, within processual research the entity under study is recognised a priori as a complex system in its own right.

[Processual research is concerned with] *“describing, analysing, and explaining the what, why and how of some sequence of individual or collective action. The driving assumption behind process thinking is that social reality is not steady state. It is a dynamic process. It occurs rather than merely exists. Human conduct is perpetually in a process of becoming. The overarching aim of the process analysis therefore is to catch this reality in flight”* (Pettigrew 1997: 338).

While the search for single causes refers back to a variance theory paradigm, Pettigrew (1997) suggests “we are now attempting to theorise about constellations of forces shaping the character of the process (context) and its outcomes”. Context here refers not only to the stimulus environment, but also to a “nested arrangement of structures and processes where the subjective interpretations of actors, perceiving, learning and remembering, help shape process” (ibid: 338). Our discussions on critical realism and causality in particular, allow us therefore to see the potential within case studies to develop explanatory knowledge regarding the necessary conditions for an entity to be the way it is. For Pettigrew (1997:342) this denotes the search for “multiple intersecting conditions which link features of context and process to certain outcomes. This approach allows for reflection on key questions as to why things stayed the same and why things changed, and critically, what were the necessary conditions for this to be possible. The following form a series of guidelines from Pettigrew (1997) that allow for internal consistencies within the research process and the treatment of data more particularly, which can facilitate the understanding of interaction and the development of inter-organisational relationships over time.

- Embeddedness – the need to study processes across a number of levels of analysis
- Temporal interconnectedness – studying processes in past, present and future
- The role in explanation for context and action
- The search for holistic rather than linear explanations of process, and
- The need to link process analysis to the location and explanation of outcomes

Based on the interrelated principles of both critical realism and processual case approach, a five-stage research process presented below offers guidance as to data collection, development of the case study, data analysis, and theorisation; all of which are required within the Critical Realist epistemological position (Danermark et al. 1997).

<b>Stages in critical realist processual research design</b>	<b>Thought operations involved</b>
1. Case description and analytical resolution	Development of chronological case history in terms of outcomes, process and emerging contexts
2. Abduction/theoretical redescription	Interpretation and recontextualisation of the phenomena with differing conceptual frameworks

3. Retroduction	A search for the structures and mechanisms by which the nature of the entity is brought into being, and which have been contingently capable of producing observable phenomena
4. Comparison between different theories and abstractions	Reflection on which theory or frame may best elucidate the necessary conditions for what is to be explained, therefore having greater explanatory power
5. Concretisation and contextualisation of research object	Involves the examination of how different structures and mechanisms interact with other mechanisms at different levels under specific conditions

Table 1: Stages in a Critical Realist longitudinal processual Case Study approach. Developed from the work of Pettigrew (1997) and Danermark et al. (1997)

There have been many contributions within the literature that suggest that longitudinal studies are the most effective way to understand both process and structural changes in dyadic relationships over time (Morgan and Hunt 1994; Halinen and Törnroos 1995; Dubois *et al.* 2003). However, Ford and Håkansson (2006: 13) suggest that while time remains a central aspect of interaction, a clear and well developed model to handle it has yet to be realised. Time, within processual research has a particular role to play, which can be considered more 'a means to an end rather than an end in itself'. The exposition of a case study in chronological terms becomes a vital starting point, from which: the potential to reveal the dynamics of the processes; the relationship between the past, present and future; as well as the interrelationship between context, process and outcomes; can be revealed (Pettigrew 1997).

*"What happens, how it happens, why it happens, what results it brings about, is dependent on when it happens, the location in the processual sequence, the place in the rhythm of events characteristic for a given process" (Pettigrew 1997: 339)*

The development of the case study itself can be facilitated by framing the empirical phenomena within differing theoretical frameworks. For example, within an IMP based study this could involve the use of key explanatory models, such as those offered by Håkansson (1982) or Möller and Wilson (1995). The objective of which is the identification of the framework that best explains the phenomena. This involves abduction, which can be defined as the "interpretation and recontextualisation of individual phenomena within a conceptual framework or a set of ideas [and/or] the ability to understand something in a new way by observing and interpreting this something in a new conceptual framework" (Danermark et al. 1997: 77). The primary goal of critical realist informed research is the unearthing of the necessary conditions for the entity to be what it is, the achievement of which is facilitated by the employment of retroduction, which is defined as:

*"A thought operation involving a reconstruction of the basic conditions for anything to be what it is, or to put it differently, it is by reasoning we can obtain knowledge of what properties are required for a phenomenon to exist. Transfactual or transcendental argumentation is a form of retroduction implying that one seeks these qualities beyond what is immediately given" (Danermark et al. 1997: 206).*

The outcome of retroduction will be the identification of the structural conditions and mechanisms which have been seen to bring about the nature of the dyadic relationship under study. Such mechanisms, can emerge in differing states including; within the conscious intentions of actors; in a less observable state within the context of processes; or in the forming of interaction or enactment of elements between process and context (Pettigrew 1997). The achievement of such an understanding will be facilitated by the unearthing of: the key sequences of action; the main transition points in the relationship; the critical personalities involved, and the multiple levels of analysis and how these impacted on the core stream of activity.

As has been discussed above, taking a complexity theory ontological position, and viewing the dyadic relationship as a complex adaptive system in its own right provides us with important insights in identifying the structural conditions and generative mechanisms which bring the particular entity to being. According to Garud and Van de Ven (2002:219), “contemporary phenomena are driven by dynamics that arise from rich connections between agents”. Connectivity therefore forms the central characteristic of complex adaptive systems, from which complex behaviour arises, including the creation and response to triggers of change, which can emerge from any part of the interdependent ‘whole’. The concept of connections between elements of a system correlates to the notion of ties emerging from interaction, which is central to the work of the IMP (Håkansson 1982). What the complexity theory notion of connectivity allows for however, is a consideration of the impact such connections has on the emergence and development of the system as a whole, and therefore has potential to provide further insights as to role of interconnectivity in developing a non-deterministic perspective on relationship development over time.

In terms of generative mechanisms, it is clear from the extant literature that inter-organisational relationships develop by way of actions, episodes and sequences (Håkansson 1982; Holmlund 2004), and by engaging in activities such as information/resource share, adaptation etc (Möller and Wilson 1995; Brennan and Turnbull 1998). Such process levels and activities therefore become the *mechanisms for change* in such relationships. Figure 1 below, is based on Sayer’s (1992) conceptualisation of the emergent qualities of structures, mechanisms and events. In this context it attempts to illustrate the emergent nature of sequences, from episodes and actions, where, for example, certain actions may influence more than one episode. Furthermore, sequences that emerge from interactions and connections between organisations cannot be seen in isolation, for to do so would be to miss the degree of interconnectivity and interdependence *between* the sequences of interaction themselves.

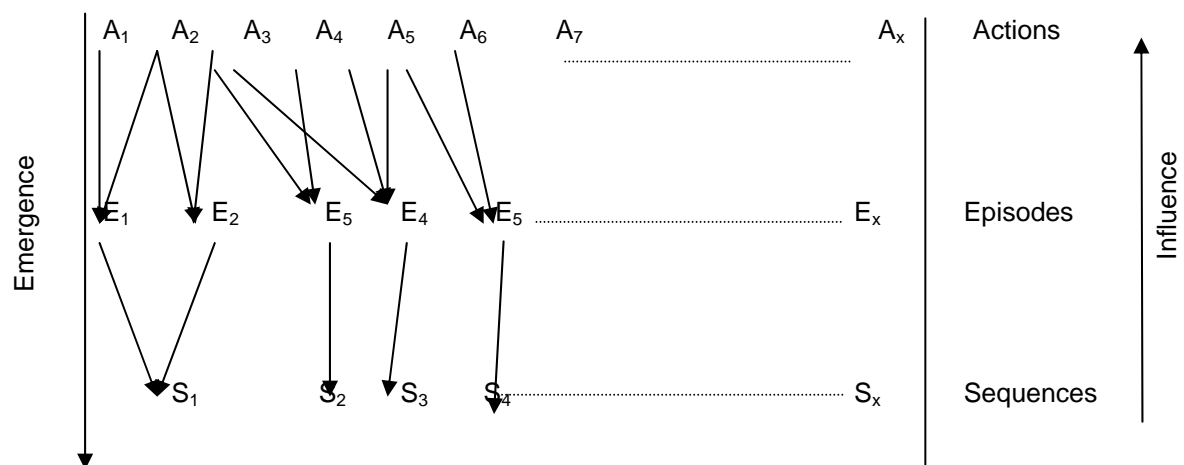


Figure 1 The emergence of sequences adapted from Sayer (1992)

It is clear then that we can deepen our understanding of how dyadic relationships evolve without resorting to determinism by developing our understanding as to how complex adaptive systems themselves develop overtime. For example, the interconnectivity between actors can be seen as a central structural condition for the emergent nature of dyadic relationships. Moreover, the generative mechanisms can include those process factors already understood within the IMP research. However, as is understood within a complexity theory perspective, when faced with a trigger for change, a dynamic and emergent entity has a level of choice regarding the response to such a trigger. An important concept within complexity theory that helps us understand which trajectory an entity will take in response to changes in the system is that of Dissipative Structures. We will now look more closely at this concept, in order to explicate the possible insights accruing in terms of understanding the development of dyadic relationships over time.

The concept of Dissipative Structures, pioneered by Prigogine and Stengers (1984) captures the dynamic behaviour of systems, as they evolve and adapt to changes within and outside the system. Therefore, dissipative structures, within complexity theory, are “ways in which open systems exchange energy, matter, or information with their environment, and which when pushed far from equilibrium create new structures and order” (Mittleton-Kelly 2003: 10). The notion of dissipative structures goes further than suggesting that systems operate in an open environment therefore by including the idea of points of instability from which new order emerges (Capra 1996). This counters traditional thinking within the physical sciences and thermodynamics in particular, which suggests that systems move inevitably towards entropy or chaos, a ‘world is running down’ belief that presupposes that systems move ever closer to death or deterioration. Traditional thinking therefore would seem to be operating within a deterministic frame, where the growth phases of a system can be understood a priori. It is this reasoning that correlates most with the received view on how relationships develop over time that is captured in life-cycle models of relationships development (i.e. Dwyer et al 1987; Wilson 1995 etc). However as Capra (1996) and Kay and Schneider (1994) suggest the biological and social worlds, do not act in such a manner, and even at a common sense level we understand life to be proliferating, that is, continuing to grow and produce new entities etc. Inherent in Dissipative Structures are changes within the system over time, which are considered both normal and necessary for the survival of the system. These changes however are not predictable, where agency is recognised in the form of choices (metaphorically speaking) for the system; “there are points in any system’s development where several possible directions of radical change are open, and it is not possible to predict, with certainty which one will occur” (Kay and Schneider 1994: 3). In open systems therefore there is a constant flow of energy moving the system far from equilibrium and where the system responds by using the energy to maintain overall structure and where new order emerges from this process; thus dissipating the energy.

*“It might be conjectured that in periods of transition or crises, generative structures, previously opaque, become more visible to agents” (Bhaskar 1989 p 48, as cited in Danermark et al. 1997)*

Critical incidents and critical phases have been offered within the literature as ways to conceptualise periods of transition or change within relationships. From a marketing discourse perspective this concept emerged from the services management literature, which looked at critical incidents as times of heightened sensitivity and evaluation on the part of the customer within a relationship (Edvardsson and Roos 2001). While it is recognised that such incidents can have both a driving or checking effect relationship development (Halinen and Tähtinen 2002), it is the latter that receives most attention, where due to its proposed link with relationship ending, such negative incidents are seen as something to be minimised in the relationship.

*“Although critical incidents can be either positive or negative, the latter seem to be more meaningful from a managerial point of view—because they require a great deal of attention, and because they can initiate the irrevocable dissolution of a relationship” (Olkkonen and Tuominen 2003: 4).*

As Kay and Schneider (1994: 6) remind us “all living systems go through cycles of birth, growth, death and renewal”, where this regeneration can occur, sometimes within a recognisable structure, and sometimes by forming new structures; this then forms the cycle of life where the death of one system may be the life force of a new emerging system. While this may, at first glance, be seen to resonate with life-cycle models of relationship development, it is the emergence of new structures which differentiates it from more deterministic thinking.

*“When a social entity is faced with a constraint, it finds new ways of operating, because away-from-equilibrium (established norms) systems are forced to experiment and explore their space of possibilities, and this exploration helps them discover and create new patterns of relationships and different structures” (Mittleton-Kelly 2003: 13)*

When faced with a trigger, either internally or externally generated, the system can either deepen or end, depending on the context in operation at the time. Eisenhardt and Galunic (2000) suggest however, that the greater the level of interaction points within the system the more able it will be to dissipate the energy, and survive or indeed be strengthened as a consequence. This suggests that

within any relationship, triggers can create, deepen or end particular sequences or projects within the relationship, or indeed the relationship itself. Understanding which of these possible outcomes will be made manifest depends on the nature of the development of the relationship up to that point. Complex adaptive systems are therefore said to react to triggers of change in differing ways, the 'choice' moreover will be dependent on the nature of the trigger as well as the history of the system (Prigogine and Stengers 1984; Mitleton-Kelly 2003). This is done through the generation of feedback loops, which can be characterised as being either negative or positive in nature.

*"Negative feedback loops are those which moderate a system, damping out change. Positive feedback, defined as feedback, which reinforces a change or trend. A system composed only of negative feedbacks will become out of step with its surrounding environment and perish. If negative feedback loops hold a system stable, positive feedback loops allow systems to explore their environment and follow new development paths. (Newman 2005:3)*

Central to processual research is the a priori acknowledgement of the emergent nature of organisations and their relationships. Setting out the sequential pattern of events, by means of historical analysis then becomes a means to an end and not an end in itself. The objective is not to search for simple causal links between empirically observable episodes, or to view past critical episodes as the single discreet cause to present behaviours in the relationship. Rather, we need as Ford and Håkansson (2006) acknowledge, and Easton (2002) purports, to move behind empirically observable episodes, to understand the structural conditions which impact on the manner in which generative mechanisms are enacted in particular empirical settings. This level of theorisation, however, according to Danermark et al (1997) must be integrated with a degree of contextualisation and concretisation of the empirical phenomena in order to understand how the different structures and mechanisms identified manifest themselves in concrete situations. This can be achieved by integrating the theorisation of the case, where the enactment of causal powers and liabilities, triggered by events in relation to specific periods in the relationship must be discussed in order to explicate the most appropriate theoretical frame to understand and explain the relationship under study.

## Conclusion

It is clear from our discussion above that complex adaptive systems do not develop sequentially through a series of stages, discreet or otherwise. Rather, the nature of development of such systems is dependent on the interrelationship between the nature of the structure, the contextual environment, and the enactment of generative mechanisms. Using these more abstract concepts, our understanding of the development of dyadic inter-organisational relationships can be deepened without resorting to deterministic life-cycle models which currently dominate the discourse. In this context, the understanding the chronological sequence of events becomes a vital starting point. From this key transition points in the relationship can be understood. Such incidents, and the nature of reaction to same, provide vital clues as to the nature of the relationship, its structural conditions and generative mechanisms. However, we can at this juncture suggest that sequential life-cycle models continue to have a place in inter-organisational relationship development research. Their value is based on their ability to make manageable complex phenomena and to give the perception of a closed working environment. Such reasoning therefore still has a place when attempting to explain the development of conceptually bounded phenomena, such as projects, or sequences in Holmlund's (2004) terms. That is to say, that within any one dyadic relationships, the inter-relationship projects that characterise the relationship can each be understood within a life-cycle framework. The central contribution of this paper however, is to suggest that when viewing the complex nature of the inter-organisational relationship, such reasoning has no place. If inter-organisational relationships are seen as dynamic open complex adaptive systems, then our understanding of how they are configured, developed, maintained, and managed, is fundamentally altered (Håkansson and Snehota 1995). Moreover, our methods to understand and explain relationships and their development must be appropriate to capture such complexity. Central to this paper then is the delineation of a critical realist epistemological position, integrated within a processual case study design, while viewing the dyad as a complex adaptive system, can do much to facilitate the capturing and explanation of the nature and development of inter-organisational relationships.

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