Actor Network Theory and Social and Environmental Accounting Research

Nick Barter and Jan Bebbington

Authors	
Dr Nick Barter (Corresponding Author) Lecturer in Strategic Management Griffith University Department of International Business and Asian Studies, N16, Room 1.49 Nathan Campus, 170 Kessels Road, Nathan, QLD 4111, Australia T: +61 (07) 373 57903 F: +61 (07) 373 55111 E: n.barter@griffith.edu.au	Prof. Jan Bebbington Professor of Accounting and Sustainable Development, University of St Andrews, School of Management Gateway Building St Andrews, Fife, KY16 9SS, UK T: 01334 462348 F: 01334 463949 E: kjb10@st-andrews.ac.uk

Actor Network Theory: A Briefing Note and Possibilities for Social and Environmental Accounting Research

Abstract

Actor-Network Theory (ANT) has been increasingly utilised within the accounting and management literature (Justesen & Mouritsen, 2011) and is argued to be useful because it includes both the human and the non human in its analytical frame. ANT bypasses a nature society dualism and as such it may help to develop organisational theories that can promote ecologically and socially sustainable development (Gladwin, et al., 1995). This article outlines the central commitments of ANT, its language, how it has been applied and its critiques. The article then discusses how ANT may contribute to social and environmental accounting research and the examination of what is social and what is environment. As such, this paper is an ANT 'primer' which aims to support social and environmental accountants in the exploration of new directions and the enabling of more ecologically and socially sustainable practices to come forward.

Introduction

Organisations have been identified as being both culpable for but also potential alleviators of environmental degradation (Bakan, 2004; Deegan & Shelly, 2006; Devereaux Jennings & Zandbergen, 1995; Gray, et al., 1993; Gladwin, et al., 1995; Sethi, 1995; Shrivastava, 1995 a,b & c), particularly if it is accepted that we live in a world where “organizations are the means through which interests are realized” (Egri and Pinfield, 1999, p. 225). Scholars (for example see; Egri & Pinfield, 1999; Gladwin, et al., 1995; Purser, et al., 1995; Shrivastava, 1995a) have argued that the ability of organisations to alleviate degradation is hampered by organisational theories that are “constricted by a fractured epistemology” (Gladwin, et al., 1995, p. 874) which separates society from nature: treating humans and nature as separate Cartesian categories (Castree, 2002; Latour, 1999a&b; Newton, 2002). While treating society and nature as distinct domains may allow us to make sense of complex situations, it is problematic as all “inputs, throughputs, and outputs have systemic interconnections among themselves and with environmental, economic, social and organisational variables” (Shrivastava, 1995c, p. 942). In short, we fail to fully appreciate how we are not separate from nature but are surrounded by and a part of it (Ingold, 2011). To tackle this artificial separation, Egri & Pinfield (1999), Gladwin, et al., (1995), Purser, et al., (1995) and Shrivastava (1995a) make a case for embracing new management paradigm(s) that are less anthropocentric and more ecocentric. They advocate a move from beliefs and values that have humans as the central locus of value towards those that see nature as the central locus. A difficulty with this move from anthropocentrism towards ecocentrism is that it “tends toward one or another extreme image of man’s (sic) relationship to nature” (Hoffman and Sandelands, 2005, p. 147): either man is everything and dominates nature

(anthropocentrism) or man is nothing and nature dominates (ecocentrism) and in both situations the society nature dualism remains.

In an attempt to escape dualism this paper introduces and argues for the further use of Actor-Network Theory (ANT) to assist our understanding of how organisations are interconnected to nature and culture. ANT scholars (Castree, 2002; Ivakhiv, 2002; Latour, 1993; Latour, 1999a&b; Latour, 2004; Latour 2005) argue that environmental and social degradations are phenomena that are “simultaneously real, like nature, narrated like discourse and collective like society” (Ivakhiv, 2002, p. 392), in short they are “nature culture imbroglios”ⁱ (Ivakhiv, 2002, p. 393). While the use of terms such as ‘nature’ and ‘culture’ may point towards conceiving of these aspects as being in separate realms, with ANT what is being promoted is that there is no split between humans and nature. Rather, the ‘realms’ are entwined and cannot be understood by the taking only the vantage point offered by focusing on humans or nature. Thus ANT attempts to abandon distinctions between these realms (see: Ashmore, et al., 1994; Callon, 1997; Castree, 2002; Fox, 2000; Ivakhiv, 2002; Latour, 1993; Latour, 2005; Law 1992; Lee & Brown, 1994; Lee & Stenner, 1999; Newton, 2001; Newton, 2002 and O’Connell, et al., 2009). In this regard, using ANT promotes the idea that we (humans) “are not in society anymore than we are in nature” (Latour, 2005, p. 241) and that humans and nature are co-constituted by each other and the terms, ‘humans’ and ‘nature’, are merely useful locational identifiers. In taking this stance, ANT arguably allows us to “stitch back together the socionatural imbroglios that [a society-nature dualism]...has rent asunder” (Castree, 2002, p. 118). As such we believe it is a theory that might allow scholars to further contribute to ecologically and socially sustainable development (Castree, 2002; Ivakhiv, 2002; Latour, 2004; Newton, 2002). As Ivakhiv (2002) states, by providing “a non-dualistic model of human-environmental relations...[ANT may aid]... in the

task of developing more appropriate ecological practices for a...pluralistic...world” (ibid; p. 392). As such, the use of ANT by social and environmental accounting researchers is likely to be a rewarding avenue to explore as the goals expressed by Ivakhiv (2002), for example, are broadly shared by the social and environmental accounting community.

This paper seeks to support the possibilities for such a linking and proceeds in the following manner. First ANT is introduced and an explanation of this ‘theory’ⁱⁱ is provided. Second some of the language of ANT is introduced and explained. Third critiques of ANT are outlined and discussed. Taken together, these sections seek to provide an introduction to ANT. In section four how ANT has been deployed in accounting and management research is described and some prescriptions regarding the use of ANT are outlined. Fifth the paper tentatively explores how ANT might be deployed by social and environmental accounting researchers. Finally, section six concludes the paper with a summary and some closing comments.

1 – Introducing ANT

ANT is an approach that is closely related to the works of Bruno Latour, Michel Callon and John Law (Callon, 1986, 1997; Harman, 2009; Ivakhiv, 2002; Latour, 1993, 1999a&b, 2004, 2005, 2010; Law, 1992, 1999, 2000; Lee & Brown, 1994; Lee & Stenner, 1999) and is an analytical lens that aims to not separate the world into the two spheres of society and nature (Harman, 2009; Latour, 2004, 2005, 2010; Lee & Stenner, 1999). Rather, ANT aims to bypass any social natural divide by arguing that “nature and society are two collectors that are a premature attempt to collect in two opposite assemblies one common world” (Latour, 2005, p. 245). Indeed, Latour

(2005) suggests that "it is a grave methodological mistake to limit in advance...the range of entities that may populate the social world" (ibid, p. 227). Further, he argues that it is "counterintuitive to try and distinguish what comes from viewers and what comes from the object when the obvious answer is to go with the flow" (Latour 2005, p. 237). Thus what ANT is asking a researcher to do is to eschew adherence solely to perspectives such as social constructionism or realism in analysis. Rather, the researcher is asked to get into the middle of the action and observe it (the action and the processes) and not move too soon to an explanation solely based on societal explanations or as arising solely from the natural world. Thus with ANT there is no demarcation of what is valid for analysis and what isn't, all is included within the frame of observation and analysis.

The application of these principles can be illustrated by an example from Law (1992), exploring what a sociologist is. Law (1992) suggests that if "you took away my computer, my colleagues, my office, my books, my desk, my telephone, I wouldn't be a sociologist writing papers...I'd be something quite other" (Law, 1992, p. 4).ⁱⁱⁱ Hence "social agents are never located in bodies and bodies alone, but rather an actor is a patterned network of heterogeneous relations" (Law, 1992, p. 4) between the human and the non-human and is social/natural in form (Callon, 1986; Castree, 2002). To explain further Latour (1999b) offers an example of the gun and the human, noting two slogans are typically found in debates about guns and their possible restriction. First "Guns kill people" (Latour, 1999b, p. 76) and second "Guns don't kill people; people kill people" (ibid). Latour (1999b) argues that the first slogan places all the agency in the gun (object) and the human (subject) is a mute intermediary for the gun's intentions, whereas the second slogan places agency in the human (subject) and the gun (object) is a mute intermediary of a human's intentions. Hence either the gun or the human is effectively everything or nothing.

ANT, however, would argue that in combination the gun and the human realises a heterogeneous relationship (of the gun-human) which in turn translates into a goal. Thus with ANT neither the gun nor the human are sole explicators or just mute intermediaries, both add something to the situation under study.

Once the individual, the bounded self, is de-prioritised humans are viewed as processes (Flannery, 2010) and an understanding that all the attributes that may normally be ascribed to human beings “are generated in networks that pass through and ramify both within and beyond the body” (Law 1992, p. 4). As such, with an ANT lens humans cannot be seen in isolation from that which makes them purposeful; humans and non-humans are intermeshed (O’Connell, et al., 2009; Steen, et al., 2006) and exist in actor-networks (Law, 1992). Consequently ANT assumes the “radical indeterminacy” (Callon, 1997, p. 2) of an individual actor and what we may term an actor or a human is merely a locational identifier for where action may be occurring.

As a result, ANT brings within its analytical view all entities (humans and non-humans) and explicitly sets out to “clear the slate of nature-culture dualism” (Ivakhiv, 2002, p. 391). This liberalism, however, is “an analytical stance, not an ethical position” (Law, 1992, p. 4). ANT does not intend that objects become endowed with ethical or moral agency (Law, 1992). Rather, ANT is about giving “due consideration and recognition of [both] the non-human and human” (O’Connell, et al., 2009, p. 20) in the analysis. Indeed, ANT is about showing how humans and non-humans are intermeshed and focuses on relationships between entities (Lee & Hassard, 1999; Lowe, 2001; O’Connell, et al., 2009). When using ANT, the analyst has to place themselves in the middle of the action where “connections are continuously being made” (Steen, et al., 2006, p. 207) and remade, decentre

everything and think relationally rather than in separations (Castree, 2002) or bounded wholes. In this regard ANT “defamiliarizes what we may otherwise take for granted” (Calas and Smirich 1999, p. 663) and everything becomes “an effect of an array of relations” (Law, 2000, p. 1). Boundaries and differences are dissolved (Latour, 2005; Law, 1992, 1999, 2000; McLean & Hassard, 2004; Newton, 2002) and are only ‘observable’ in so much as the analyst places them as an explanatory device into the action. Thus “cultures and ecologies...[are]...not some essential bounded wholes but at best only analytically distinguishable moments within the fluid activity of network building” (Ivakhiv, 2002, p. 399). In short, all is a performance rather than a final or original state (Calas & Smircich, 1999).

In sum, ANT brings forward a world of work, movement and flow where everything is a relational field. This can be a challenging aspect to ANT as “order becomes an effect generated by heterogeneous means” (Law, 1992, p. 3), not some final or end state. Thus entities as we discern them are a momentary pause, a form of punctualisation (Law, 1992), “an achievement, a process, a consequence, a set of resistances overcome, a precarious effect” (ibid, p. 8). A difficulty with this focus on flow is that nothing is ever complete, final or autonomous (Law, 1992) and there are no fixed points from which to analyse or build theory. In an attempt to escape this quandary, Law (2000) suggests that ANT can occur at various levels of magnification. To explain, in discussing his ANT analysis of Portuguese imperialist expansion in the 15th century, Law (2000) outlines that the analysis can be done at the level of an individual vessel and its “network of hull, spars, sails, ropes, guns, food stores” (ibid, p. 3) through an increased magnification to focus on the navigational system of a ship and its network or through a decreased magnification to consider the Portuguese imperial system as a whole and its “ports, ...its vessels, its military dispositions [and] its markets” (ibid, p. 3). Similarly the social and

environmental accountant might choose a calculation, a definition, a website, a report, an individual, a team, an organisation, an industry, a feature in a landscape, an ecosystem or any variant thereof that is either a human or non-human as the focal point of their analysis.

2 - The Language of ANT

To support ANT's attempts to bypass essential differences, a particular vocabulary has emerged within ANT. Five key terms are now explained in order to facilitate further understanding of ANT (a longer glossary is contained in Table 1).

The term 'actant' is used to resist any anthropocentrism and anthropomorphism that may be associated with the term actor (Fox, 2000). Thus actant is a term that aims to be more neutral than the term actor and reinforce that within an ANT analytical stance both humans and non-humans can act. The term may also help reinforce that "agency is a relational effect" (Castree 2000, p. 121) and an actant is defined as a relational field that is the effect of an array of relations (Law, 2000) and a locational identifier to network traces (Latour, 2005).

Second, the term 'collective' is intended to be a neutral term to help bypass any "reified and abstract use of collective categories" (Steen, et al., 2006, p. 307) such as society and nature and thus reinforce that with ANT the analytical stance is open.

Third, the term 'flat land' is used to denote how scale and hierarchy of any form are not assumed and all connections need to be fully traced (Latour, 2005). Within ANT

the world is not reduced to agency and structure frameworks or scalar contextualisers such as macro and micro and hence all relationships have to be fully traced. If the scale or 'structure' cannot be fully explained through relationships or patterns of relationships then it is assumed that all the relationships have not been fully traced (Latour, 2005) and the analyst has missed some aspect.

Fourth, the term 'translation' is a term used to highlight how, with reference to the earlier sociologist in a web of relationships example, the sociologist and a journal might relate. Specifically, the sociologist may wish to promulgate their current thinking and this is translated through an academic journal.^{iv} Thus the term translation attempts to highlight that the two actants (the sociologist and the journal) act on each other and in so doing neither is autonomous (Latour, 1999b). More widely any device, organisation or institution is generated through a process of translation (Law, 1992) and it is through translations between different actants that new negotiated goals are realised (Steen, 2010). A further example to help elucidate this aspect of ANT, and avoid the retreat to an object or subject orientated focus is to consider how nothing can be separate from the assemblage that brought it into being (Guattari, 1989) or more simply how what is visually perceived is actually a result of a relationship between the observer and the observed (Gibson, 1986).

Fifth, the term 'punctualisation' is used to highlight and reinforce that everything is in flow and thus "precarious" (Law 1992, p. 5). Thus while an analyst can use punctualised entities such as an organisation as an actant and locational identifier, the actant is continually in process.

(INSERT Table 1 ABOUT HERE)

Table 1 outlines some key terms and highlights how ANT is replete with terms that have a particular meaning. Specifically, when using ANT the analyst must remember that anything can be an actant and overall there is a singular collective. In addition, scale or hierarchy cannot be assumed rather all connections need to be fully traced. Actants, acting upon each other, realise a translation and finally everything is in motion, nothing is given in the order of things and an actant is only ever an effect of an array of relations.

3 – Critiques of ANT

An elucidation of ANT would not be complete without considering critiques of it, including those offered by Latour (1999a) and Law (1999a), two of the main proponents of ANT. Latour (1999a) argues that what is wrong with 'Actor-Network Theory' are the words 'actor', 'network', 'theory' and the punctuation mark (the 'hyphen').^v In particular, Latour (1999a) raises three criticisms. First he highlights how the term network carries with it a view that there is "unmediated access to every piece of information" (Latour, 1999a, p. 15) without translation. This point is also made by Law (1999a) who adds that the term network carries with it baggage regarding computer networks, social networks, rail networks and the like. Second Latour (1999a) argues that the hyphenated nature of the term actor-network creates a mistaken view that the two terms are in contrast to each other which itself triggers an agency/structure debate. Rather, the terms were hyphenated to try to emphasise that an actor is a network and vice versa (Latour 1999a). Third Latour (1999a) criticises the term theory arguing that ANT was never a theory in a conventional sense, in that it cannot sit outside of that which it purports to represent, as might a

modernist theory. Rather ANT is a “very crude method to learn from actors without imposing on them an *a priori* definition of their world building capabilities” (Latour, 1999a, p. 20).

Law (1999) also criticises ANT from a naming perspective, arguing that the acronym ANT has done more harm than good. Particularly so because of the “desire for quick moves and quick solutions...[and]...to point and name” (ibid, p. 8) and the “tension originally and oxymoronically” (ibid, p.8) built into the linking of actor and network that is lost in the acronym ANT (rather than using ‘Actor-Network Theory’). He argues this harms understanding because it obscures the complexity of a centred actor in tandem with a decentred network (which is intended to be relayed by the term ‘actor-network’). While this is problematic, he also notes that the ANT acronym has made the concept “easily transportable” (Law, 1999, p. 8) and hence increased its influence.

Moving away from critiques levelled by Latour and Law, Ivakhiv (2002) highlights two further critiques. First, he argues that ANT provides little understanding of the differing motivations of actants because ANT treats all actants symmetrically. Thus the social psychology of ANT is rendered “thin and homogeneous” (Ivakhiv, 2002, p. 394) due to the assumption that “actants are said to mobilise other actants to build and strengthen their networks...but their motivations for doing so are unaccounted” (ibid, p. 394). Second, and again because of the symmetry in ANT, he argues that there is a loss of “normative positioning” (Ivakhiv, 2002 p. 395) and critical analysis of structures such as capitalism cannot be conducted from within ANT. While the need for understanding motivations and critical analysis is not in doubt, Briers & Chua (2001 p. 243 citing Latour, 1991, p. 129) suggest that “explanation emerges once the description is saturated”. As such, it is possible for social psychology and

normative positions (innately human aspects) to be brought to an ANT analysis should an actant (the reader or another writer) wish to do so.

Whittle and Spicer's (2008) critique of ANT makes a similar point when they state that while ANT is a "valuable framework for the empirical analysis of the organising process, it cannot provide a critical account of organisation" (ibid, p. 611). In particular, they argue that critical theories need to include three components a "a commitment to ontological denaturalisation,... the pursuit of epistemological reflexivity and... a politically anti-performative stance" (ibid, p. 612). Specifically, they elaborate on these critiques by stating that denaturalisation involves "recognising that the way things are is neither natural nor inevitable...reflexivity involves rejecting an assumption that reality is 'out there' waiting to be captured by a researcher...[and] anti-performative involves moving beyond reinforcing existing power relations towards considering new forms of social order" (Whittle and Spicer, 2008, p. 12). Whittle and Spicer (2008) argue that ANT does not have these three components within it and thus it cannot be considered to be critical.

Like the critiques offered by Ivakhiv (2002), Whittle and Spicer (2008)^{vi} are critiquing ANT for not having something that it never claimed to have. In particular, one could argue that one of ANT's strong points is it requires a full analysis of relationships between actants which could easily ensure a 'de-naturalization' of the status quo. Moreover, the ANT approach is strongly cognisant of reflexivity. Indeed, ANT requires the analyst to ask the simple, obvious and stupid questions and assume nothing in order that all traces can be recorded and uncovered. Indeed, where an ANT inspired study would differ from Whittle and Spicer (2008) is the desire to move to a different sort of order. As before, this would be possible to do by utilising an ANT analysis, but it is not the purpose of ANT itself. Rather, an ANT analysis

provides a base from which the analyst can build a strong critique or an anti-performative political stance.

To summarise, the previous three sections introduced ANT and some of the language and critiques of ANT in an attempt to explain the 'theory' to the reader. The next two sections of the paper will explore how ANT has been deployed in a selection of accounting and management studies. The paper will then move to a discussion of how social and environmental accountants could deploy ANT and what insights might be gained from doing so.

4 – Applying ANT (Examples and Prescriptions)

ANT has been utilised within a variety of contexts within the accounting and management literature. Table 2 provides an overview of some studies that have deployed ANT, describing why ANT was used, what data sources were developed and the key findings of the work.

(INSERT Table 2 ABOUT HERE)

Table 2 indicates that researchers are using ANT because it allows the non-human as well as the human to be brought into the frame of analysis: a point reinforced in a recent review of accounting papers that cite Latour by Justesen and Mouritsen (2011).^{vii} Table 2 also indicates that accounting scholars are using ANT to highlight the role of calculations and/or accounting systems^{viii} as actants rather than only relying on analysing interactions between human actors. A common theme in the

studies is that ANT allows researchers to elucidate how a variety of actants are deployed in order to enable a new practice, model or system to be adopted (for example see; Briers & Chua, 2001; Caron & Turcotte, 2009; Czarniawska, 2009; Emsley, 2008; Whittle & Mueller, 2008; 2010). The studies suggest innovations are not adopted because they are the 'best' but because a variety of actants are enrolled (reports, buildings, accounting systems, calculations) and in so doing, the network around an innovation is strengthened, ensuring the innovation is adopted. The studies dispel the notion of a 'hero' individual driving through an innovation. Rather, any individual is but one part of a wider network of actants that help to ensure successful adoption of an innovation.

Table 2 also indicates that ANT does not require specific research methods. Rather, data gathering methods include, but are not limited to: interviews, research diary entries (drawing from direct observation), document analysis, website reviews and correspondence (including emails). In addition researchers tend to use a mixed methods approach and often have had extended access to a research site. These two aspects are congruent with the emphasis within ANT upon developing detailed understanding of situations in order to ensure all relationships are traced (for example see; Latour, 1987, 1999a, 199b, 2005). Nevertheless, while studies may focus on extended access and multiple data sources, ANT studies have also relied solely upon interviews (Lowe, 2001) or documentary analysis (Caron & Turcotte, 2009; Czarniawska, 2009).

Prescriptions for how an ANT study should be conducted have also been outlined by its founders with Latour (1987) offering seven rules of method and six principles (see Table 3). These rules of method and principles are laden with terms such as

engineers and scientists, terminology that belies the content of the text *Science in Action* (Latour, 1987).

(INSERT TABLE 3 ABOUT HERE)

In summary, the focus within an ANT study is on the work, movement and flow or more simply what actants do. Consequently, when conducting an ANT study an organisation and its fate is decentred and what is done by humans and non-humans is the central focus. This focus on doing can demand what has been termed the “sociological eye” (Whittington, 2007, p. 1577 citing Hughes, 1971) where there is a sensitivity to connections, relationships (Whittington, 2007 citing Snow, 1999) and a “sense of irony, by which...[it is meant]...an appetite to uncover the neglected, the unexpected and the unintended” (Whittington, 2007, p. 1577). The focus on practice^{ix} also brings forward how any privileging of discourse should be avoided (Latour, 1993) and thus an ANT study that overtly relies on oral testimony (interviews) is ultimately limited. Similarly, the researcher should be mindful of privileging one actant over another and thus he/she should strive to be agnostic between both human and non-human actors as well as ensuring that both are treated symmetrically and accounted for (McLean and Hassard, 2004).

5 – ANT and Social Environmental Accounting Research

This section outlines what ANT may offer social and environmental accounting research. At the time of writing, ANT has not been deployed extensively in studies that fall within the area of concern of the readership of this journal.^x As indicated in

Table 2, ANT has been deployed to enable the tracing of, for example, calculations and as such its use to date has been consistent with how ANT opens up the analytical frame to include both the human and the non-human and their intermeshing. Taking this as a cue, social and environmental accountants could, for example, use ANT to study the intermeshing of humans and non-humans around the production of sustainability reports, with the report as the focal point. Likewise they could use ANT to explore the production and impact of environmental footprint calculations and or other sustainability indicators, where the numbers or the calculations are the focus. However, these uses of ANT are arguably relatively simple and obvious extensions of ANT and a more fundamental application is also possible.

ANT might be used to reflect back on what it means to be a social and environmental accountant and, in particular, the lived meaning of the terms 'social' and 'environmental' in different settings. As discussed, ANT seeks to discard the notion of separate categories of 'social' and 'environmental' yet these terms form the core of what it means to be a social and environmental accountant in that they constitute the label used and reinforce the difference between this and other types of accountant.

To explain, social and environment accounting has been compressed to the label 'social accounting' (Gray, 2010), a term which it has been argued embraces "environmental, ethical, responsibility and sustainability accounting, accountability, reporting, auditing, investment, and costing and management (Gray, 2010, p. 12). Social accounting has also been identified as being concerned with "ameliorating the social and environmental impacts arising from conventional accounting practice" (Gray, 2010, p. 12) and deriving and developing "new methods of accounting that

might be implicated in more benign social and environmental effects" (ibid, p. 12). Taking this reasoning forward, social accounting covers a panoply of areas and its concerns rely on articulating that there are separate domains of society and the environment upon which conventional accounting has an impact and that relationship will be antagonistic. Further social and environmental accountants can prescribe potential cures for social and environmental ills because society and the environment are separate categories on which the researcher has a view and which can be used to formulate prescriptions.

Social accounting has also been questioned with regard to its particular embrace of environmental concerns (Owen, 2008) and within those whether the focus has been on those issues which can be "translated into the economic" (Gray, et al, 2009, p. 552): a situation which has been described as "unhealthy" (Gray, et al, 2009, p.556). This has also led to questioning whether accountants have an inability to "escape the epistemology of modernity" (Gray, et al, 2009, p.559 also citing Lehman 2006, 2007 in support) with a concurrent call for them to "move back from the compartmentalisation of life" (Gray, et al., 2009, p.559). As outlined in the introduction to this paper, modernity relies on compartmentalisation and on treating the society and the environment as separate categories, while ANT abandons distinctions and compartmentalisation.

Consequently we would argue ANT offers a way out of the quandary of compartmentalisation, a modernist epistemology and the quandary of the social and environmental accounting 'definition' reinforcing these traits. A difficulty in doing this is that in using ANT social and environmental accountants have to unhook themselves from the very terms that define them. Thus (and forgive the oxymoronic language in this sentence given ANT does not separate out society and the

environment), ANT allows the 'environment' and 'society' to be re-problematized, re-connected and re-traced. Questions such as how these elements are constituted and how they show themselves in organisational life and reports that are produced to reflect beliefs about these matters can be asked. For example, is the environment outside the walls of the office and contained within green spaces? Is the environment an actant or bundle of different actants? Or is the environment everything and as such it is nothing and as such when the 'environment' is discussed what actant is actually acting? - likewise with society and social concerns. Thus the way boundaries are created to demarcate environmental and society in sustainable development reports and if these ever reflect a nature-culture imbroglio would be an interesting avenue to explore. Taking this ANT informed line of reasoning and questioning, social and environmental accountants may well find that they obtain a view of their subject and subject matter that enables them to "escape the epistemology of modernity" (Gray, et al., 2009, p.559 also citing Lehman 2006, 2007 in support)

From a methods perspective, applying ANT to social and environmental studies might reinforce the usefulness of exploring the flow of organisational life and in-depth explorations of how actants translate social and environmental concerns within centres of calculation, what is black boxed (and what is not) and the role of boundary objects in that task. Such an application also speaks to calls within social and environmental accounting for case based analysis of actual practices (Adams and Larrinaga-Gonzales, 2007). This might also help researchers avoid compartmentalisation and in so doing bring forward new insights that may emphasise how all inputs and outputs "have systemic interconnections among themselves and with environmental, economic, social and organisational variables" (Shrivastava, 1995c, p. 942). Further it may enable the transformation of

organisations towards a “new model of entity” (Gray, et al., 2009, p. 564) or the “abandonment of organizations as entities altogether” (ibid).

Finally, it would also appear that social and environmental accounting has paid less attention to the role of calculation than it might. In particular, Justesen and Mouritsen (2011) suggest that a key contribution of ANT has been to bring “back the role of calculations as central objects in the study of accounting phenomena” (ibid, p. 161) after a time in which accounting research had “been concerned primarily with either the role of the macro-context or of the personal sense making and meaning construction related to accounting phenomena” (ibid, p. 161). With the rise of various forms of ‘carbon’ accounting, this might be a timely moment to apply an ANT lens to that area of work. Taken together, it would appear that ANT might usefully contribute to social and environmental accounting.

6– Summary

This article sought to explain how ANT could be of use to social and environmental accounting researchers and how it might provide a different perspective to this field. It was argued that ANT might enable researchers to move beyond criticisms that the field is inherently conservative and not able to move beyond a modernistic epistemology (Gray, et al., 2009) and in so doing the understanding of ‘society’, ‘environment’ and what an organisation is might ultimately be challenged. To build its case the article introduced and explained the language used by ANT as well as providing a discussion of previous applications and critiques of ANT.

In sum ANT seeks to bypass the nature society dualism; it may be a useful theory to enable organisations and organisational participants to contribute to ecologically and socially sustainable development (Castree, 2002; Ivakhiv, 2002; Latour, 2004; Newton, 2002) because it does not perpetuate a “fractured epistemology” (Gladwin, et al., 1995, p. 874). Indeed, Latour (2004) is a text that develops and utilises ANT concepts to discuss how a more sustainable relationship between humans and the wider earth collective can be realised: it is an investigation into the imbroglia that is life.

End Notes

ⁱ An imbroglia can be defined as “a confused heap” or “a state of great confusion; a complicated or difficult (esp. Political or dramatic) situation; a confused misunderstanding” (Oxford Dictionary, 2007: 1329)

ⁱⁱ The term theory has been put into inverted commas as ANT has been argued by ANT’s key protagonists that it is not a theory in a conventional sense, rather “with ANT we push theory one step further into abstraction” (Latour, 2005:221). Furthermore because ANT emphasises work, movement and flow and thus does not assume a solid fixed base it has “never been able to coalesce into a theory in a modernist sense” (Calas & Smircich, 1999:663).

ⁱⁱⁱ This argument could also be made about social and environmental accountants. Whereby a social and environmental accountant is not somebody in and of themselves, rather a social and environmental account is a pattern of relationships (both human and non-human) for example: the courses they teach, the authors they cite, the department they are part of, the company they keep, the conferences they attend, the journals their articles are published in, how they seek to incorporate society and environmental considerations into their work, etc.

^{iv} A key aspect when taking an ANT analytical stance is that both the sociologist and the journal act on each other. A joint action that impacts the sociologists goals and also to a degree the goals of the journal, thus a translation occurs. Another way of considering how ANT informs is to consider the process of Pasteurisation and Latour’s studies into this process. With regard to the ferment of the lactic acid, the realist might claim “you grant too much to the constructivists by admitting you did it all yourself!....[while] the social constructivists are similarly outraged: How can you claim the lactic acid ferment exists on its own, without you, when you yourself are pulling the strings!” (Latour 2010, p.17). With ANT the rationale is not to retreat to either perspective (realist or constructivist), rather this dualism should be bypassed and the focus placed on the action.

^v However, it should be noted that Latour (2005) pulls back from his rejection of the terms actor, network and theory and the acronym of ANT in his later work and accepts the terms and acronym given they have been widely adopted.

^{vi} These arguments offered by Whittle and Spicer (2008) are coherent within a context in so much as if an ontology and epistemology that splits the world into two collective categories is accepted, then a critical account would likely have a commitment to the three components they outline. However, ANT does not have this commitment within it; rather it aims to bypass any attempts to split the world into society and nature as collective categories. Thus a commitment to denaturalisation cannot be within ANT, as ANT is not committed to nature or denature, it wants the analyst to move past these conceptions and go with the flow. Second regarding a reflexive epistemology, within the argument as portrayed by Whittle and Spicer (2008), there is no reason why multiple ANT accounts of the same phenomena could not be produced. Thus in many regards this challenge to ANT is potentially a red herring in so much as any analysis using any framework or theory suffers with the singularity that is the voice of the author(s) of a particular account. Third regarding a commitment to anti-performative politics we believe that Whittle and Spicer (2008) have missed how any critique is the result of a relationship between that which is to be analysed and the analyser (analyst).

^{vii} Justesen and Mouritsen's (2011) paper is primarily focused on explicating the later writings of Latour and is thus a useful paper to read as an adjunct to this briefing note. Justesen and Mouritsen (2011) reviewed papers from between 1988 and 2008 that cite Latour from the following four journals; Accounting, Organisations and Society, Accounting, Auditing and Accountability Journal, Management Accounting Research and Critical Perspectives on Accounting. They highlighted that in 1988 one paper from these four journals cited Latour, a figure which has steadily increased to 25 papers from the journals citing Latour in 2008.

^{viii} Justesen and Mouritsen's (2011) review also indicates that ANT is being used by scholars to reinforce the role of calculations rather than just human actors.

^{ix} Given this focus on practice, data for potential capture might also include flip charts, the use of post-it notes, computer software, the spatial context i.e. a room and its makeup and even the CEO pacing up and down and more generally the role of the body and body movement (Rasche & Chia, 2009). This sort of data also arguably requires an expanded form of data capture that involves not just the text or audio recordings but also visual capture via photograph or video (Johnson, et al., 2007; Rasche & Chia, 2009). Further to audio and video, Strati's (2010) discussions of how when doing research at a site the researcher entering the site should use all five of their senses, a reliance on visual and auditory media may be limiting and perhaps researchers could also consider the use of smell, touch and perhaps even taste (should it be appropriate). However in expanding the mode of data capture there may also be a requirement for an ANT account of a study to perhaps move away from a reliance on a written textual narrative in the form of a conventional journal article towards an account that incorporates not only text but also images and video. Thus the account may be delivered electronically and both read and viewed.

^x As Table 2 highlights, at the time of writing; only one study, the Caron and Turcotte (2009) study of sustainability reports of ten Canadian companies and the Global Reporting Initiative (GRI) calculations, has been identified as using ANT and also being a study that could be argued as sitting broadly within the area of concern of the readership of this journal. Caron and Turcotte (2009) used ANT to bring forward the role of GRI calculations and also debate whether sustainability reports were a form of path dependence (ie suffering with corporate capture) or path creation (a new route for organisations). Caron and Turcotte (2009) summarised that sustainability reporting realised a mix of path dependency and creation for the organisations' reports that they studied.

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TABLES FOR THE TEXT

Table 1: ANT Terms – Some Descriptions

Term	Description
Actant	<ul style="list-style-type: none"> The term actant is more neutral than the term actor (Castree 2002; Ivakhiv, 2002; McLean & Hassard, 2004) and it aims to reinforce that “agency is a relational effect generated by interacting components whose activity is constituted in the networks of which they form a part” (Castree, 2002, p.121) An actant can be at many levels – an institution, an individual, a country, a thing (Law, 2000) and an actant reveals where the plan is hatched. It’s a locational identifier to the network traces that brought the plan into the world (Latour, 2005). Importantly an actant designates a source but is also a mediator being mediated (Latour, 2005).
Black Box	<ul style="list-style-type: none"> Those facts that are generally accepted as true are said to be black boxed. Although facts in these boxes can be challenged, arguing the link between the claimant and the claim is no longer necessarily required because of the taken for granted status (O’Connell, et al., 2009).
Boundary Objects	<ul style="list-style-type: none"> Boundary objects have been described as having a ‘hard’ outside and a ‘plastic’ inside (Briers & Chua, 2001). For example, a product has a hard outside (that is, it is an unambiguous actant when observed by another actant external to an organisation) yet it can be seen as a cost by accountants and a revenue item by marketers (thereby giving it a plastic inside). “These common objects enable functional specialists to use their different perspectives relatively autonomously and for cooperating parties to share a common referent” (Briers and Chua, 2001, p.242). Therefore, a “boundary object ties together actors with diverse goals because it is common to multiple groups but is capable of taking on different meanings with each of them” (Briers and Chua; 2001, p.241).
Centre of Calculation	<ul style="list-style-type: none"> “Any site where inscriptions are combined and make possible a type of calculation. It can be a laboratory, a statistical institution, files of a geographer, a data bank and so forth. This expression locates in specific sites an ability to calculate that is too often placed in the mind” (Latour, 1999b, p.304). Within centres of calculation “inscriptions of different traces are accumulated and used to act on a distant periphery” (Cuganesan, 2008, p. 82).
Collective	<ul style="list-style-type: none"> A neutral term to bypass social and natural categorisation and emphasise that the world is full of things as opposed to two realms of nature and society (Latour, 2005). [so is the term used to describe the whole of an analysis?]
Intermediary	<ul style="list-style-type: none"> An intermediary “transports meaning or force without transformation”

Term	Description
	(Latour, 2005, p. 39). For all practical purposes an intermediary can be taken as being a black box.
Mediators	<ul style="list-style-type: none"> • "Mediators transform, translate, distort and modify the meaning or the element they are supposed to carry" (Latour, 2005, p. 39). A conversation maybe a complex chain of mediators where passions, opinions and attitudes are present at every turn.
Organisation	<ul style="list-style-type: none"> • "An achievement, a process, a consequence, a set of resistances overcome, a precarious effect" (Law, 1992, p.8).
Overflowing	<ul style="list-style-type: none"> • Denotes the impossibility of total framing, i.e. internalising all externalities (Callon, 1997).
Plasma	<ul style="list-style-type: none"> • That which is not yet formatted, measured or engaged with (Latour, 2005).
Punctualisation	<ul style="list-style-type: none"> • "Network patterns that are widely performed are often those that can be punctualised. This is because they are network packages -- routines -- that can, if precariously, be more or less taken for granted in the process of heterogeneous engineering. In other words, they can be counted as resources, resources which may come in a variety of forms: agents, devices, texts, relatively standardised sets of organisational relations, social technologies, boundary protocols, organisational forms -- any or all of these... Punctualisation is always precarious; it faces resistance, and may degenerate into a failing network. On the other hand, punctualised resources offer a way of drawing quickly on the networks of the social without having to deal with endless complexity" (Law, 1992, p. 5).
Translation	<ul style="list-style-type: none"> • "Translation is a verb which implies transformation and the possibility of equivalence, the possibility that one thing (for example an actor) may stand for another (for instance a network)" (Law, 1992, p.5). • Translation generates ordering effects such as institutions and organisations (Law, 1992).

Table 2: Overview of Some Studies that Utilise ANT

Author and Focus of Paper	Why ANT Applied in Study	Data Sources	Findings/ Discussion
<ul style="list-style-type: none"> • Cuganesan, 2008 • Role of accounting numbers to calculate customer intimacy 	<ul style="list-style-type: none"> • Investigating the role of accounting numbers “requires giving equal voice to both the social and the technical” (Cuganesan, 2008, p. 82) 	<ul style="list-style-type: none"> • Interviews, formal and informal, attendance at meetings, observation days, document review – over a 2 year period 	<ul style="list-style-type: none"> • Details how customer intimacy (a measure of a relationship) is reduced to a calculable number with the numbers then taking on a ‘truth’ – but a ‘truth’ that was debated between two groups via a ‘numbers war’. • In particular the study highlights how numbers have a role with regard to their ability to act at a distance on people. Thus not everything is reduced to person to person interaction. As such the numbers are implicated as key actants acting upon other actants (people) and the groups which calculate the numbers as competing centres of calculation. The ANT framework allows the analyst the space to include the role of the numbers. What is also brought forward is a discussion of how the numbers are calculated and became a focus of debate. Thus the numbers are a thing – an actant.
<ul style="list-style-type: none"> • Emsley, 2008 • How a cost of quality construct is not ‘stable’ and subject to different interpretations in different sites/chemical 	<ul style="list-style-type: none"> • Differences found in the implementation of the cost of quality at the sites were “not found in variables such as the level of decentralization that mainstream theories such as 	<ul style="list-style-type: none"> • Interviews, diary notes, meeting attendance, document review – over a 26 month period 	<ul style="list-style-type: none"> • The paper outlines how a cost of quality technique is not inarguable but subject to different translations. The ANT lens allows consideration of the cost of quality technique to be viewed as a thing in and of itself, but also allows other actants such as end of monthly reports to be implicated in a legitimisation

Author and Focus of Paper	Why ANT Applied in Study	Data Sources	Findings/ Discussion
plants.	contingency theory might suppose (which were largely the same across the two plants), but in terms of how the heterogeneous interests of actors translated the cost of quality in each plant." (ibid, p.376)		process. The case outlines how the calculation becomes enrolled by one manager to support that managers ends and how the cost of quality technique eventually becomes black boxed.
<ul style="list-style-type: none"> • Lowe, 2001 • Application of an accounting system in a healthcare provider 	<ul style="list-style-type: none"> • The spread of technology and the role of inscriptions came to be dominant themes from the research. Thus "the combination of the apparent significance of the systems developments and the interest people showed in them combined to" (ibid, p. 339) move the theoretical frame being identified as ANT. 	<ul style="list-style-type: none"> • Interviews over a period of c6 weeks (although time period is difficult to deduce from paper) 	<ul style="list-style-type: none"> • The case brings forward the role of software and a budgeting system as an actant within a hospital system. ANT allows this non human actor to come forward in so doing it reinforces the interrelated nature of systems and humans. Thus the point being made is that is not social constructionism nor realism occurring its an entwining of the human and the non human.
<ul style="list-style-type: none"> • Briers and Chua, 2001 • The role of different boundary objects in holding together networks to 	<ul style="list-style-type: none"> • ANT used to illustrate how networks of heterogeneous actors can influence an organisation's accounting practices, "particularly 	<ul style="list-style-type: none"> • Personal and group interviews, observations and reviews of internal and public documents over a period of 3 years 	<ul style="list-style-type: none"> • Study outlines how an accounting system was introduced and changed by a variety of actants include data repositories, protocols and alike. The study outlines how any notion of a heroic individual is false, many actants needed to be enrolled in order to implement and change

Author and Focus of Paper	Why ANT Applied in Study	Data Sources	Findings/ Discussion
realise accounting change during the implementation of activity based costing	because of a wariness regarding diffusion theories of innovation that are overly socially determined" (Briers and Chua, 2001, p. 240).		<p>the system.</p> <ul style="list-style-type: none"> • The paper builds a typology of boundary objects such as cost driver matrices, customer/supplier databases, modularised financial packages. Adding a new one, visionary objects – the precise identity of which is not known until built but the object is built within a frame of, for example – efficiency is good and then an object/system would help deliver on that aim. • ANT allowed the non-humans to be included in the analysis without over reliance on the social interactions.
<ul style="list-style-type: none"> • Whittle and Mueller, 2008 & 2010 • How innovative ideas are enrolled and do not succeed purely by diffusion (2008) and how management accounting systems can impact the construct of business strategy (2010) 	<p>In both studies</p> <ul style="list-style-type: none"> • Analysis of data took "inspiration from ANT" (Whittle and Mueller, 2008, p. 448) • ANT applied via iterative movement between data and literature • ANT used as it highlights how truth relies on the formation of heterogeneous networks 	<p>In both studies, interviews, meeting observations, field notes, document review - over a period of 4 years</p>	<ul style="list-style-type: none"> • 2008 study indicates that 'ideas' don't flourish because of the heroic actions of one individual – rather a network of actants needs to be enrolled in order for an idea to be implemented. Actants included accounting calculations, contracts, not just clients. The study grounds the discussion of ideas within the subject of intrapreneurship and illustrates how the those assumed to be neutral are not intermediaries but rather mediators. • 2010 study draws on the same evidence base as the 2008 study. However the 2010 study highlights the role of the management accounting system in the construction of strategy in so much as the numbers produced had an effect on the development of the strategy.

Author and Focus of Paper	Why ANT Applied in Study	Data Sources	Findings/ Discussion
			ANT thus allowed the non-human to take on a central role.
<ul style="list-style-type: none"> • Jeppesen, 2010 • Standard setting by the Danish professional auditing body between 1970 and 1978 	<ul style="list-style-type: none"> • ANT was used because it allows human and material actors to be studied as “equal representatives” (Jeppesen, 2010, p. 177) 	<ul style="list-style-type: none"> • Interviews and a review of publically available documentation 	<ul style="list-style-type: none"> • This study explored standard setting and in particular brought forward the actors involved in intersement (an ANT term for ensuring others accept the roles assigned to them). Intersement emerged as a key requirement in standard setting. • The study identifies five actants involved in intersement – alignment of interests, representation, due process, soft texts (those that are easily agreeable and have no hard facts) and reference to ideology.
<ul style="list-style-type: none"> • Czarniawska, 2009 • How the London School of Economics Emerged 	<ul style="list-style-type: none"> • Draws on ANT and its concept of enrolment to outline how the human and non-human is enrolled in order to aid the development of a theory of institutional entrepreneurship 	<ul style="list-style-type: none"> • Review of website – authored history of the London School of Economics 	<ul style="list-style-type: none"> • The paper outlines how in building the institution of the LSE, the actants recruited, enrolled, translated and stabilised each other. In turn this process used actants a prime example being a building to house classrooms and a library. Thus the building became an actant that helped advance the institution. The paper furthers the discussion of network building by questioning whether the heroic entrepreneur is ever needed, as opposed to the individuals being a function of the network they are in.
<ul style="list-style-type: none"> • Caron and Turcotte, 2009 • Analysis of sustainability reports 	<ul style="list-style-type: none"> • Inspired by ANT’s model of innovation via enrolment of heterogeneous actors (human and non-human). 	<ul style="list-style-type: none"> • Deductive and inductive coding of 10 sustainability reports 	<ul style="list-style-type: none"> • Paper analysed sustainability reports as artefacts of a compromise between an institutional entrepreneur (the GRI) and companies. The study uses ANT ‘lightly’ to describe how the actants (the reports) are a

Author and Focus of Paper	Why ANT Applied in Study	Data Sources	Findings/ Discussion
			<p>compromise and demonstrate path dependence and path creation. Further the actants putting tension on the report are GRI calculations, institutions and companies.</p> <ul style="list-style-type: none"> • Argues a report is an actant that is under tension between other actants principally the organisation and GRI criteria.

Table 3: Latour (1993, pp.258-259) Rules of Method and Principles

	Seven Rules of Method
Rules of Method (Latour, 1993, p. 258)	<ol style="list-style-type: none"> 1. We study science in action and not ready made science or technology; to do so, we either arrive before the facts and machines are black boxed or we follow the controversies that reopen them 2. To determine the objectivity or subjectivity of a claim, the efficiency or perfection of a mechanism, we do not look for their intrinsic qualities but at all the transformations they undergo later in the hands of others. 3. Since the settlement of a controversy is the cause of Nature's representation, not its consequence, we can never use this consequence, Nature, to explain how and why a controversy has been settled. 4. Since the settlement of a controversy is the cause of Society's stability, we cannot use Society to explain how and why a controversy has been settled. We should consider symmetrically the efforts to enrol human and non-human resources. 5. We have to be as <i>undecided</i> as the various actors we follow as to what technoscience is made of; every time an inside/outside divide is built, we should study the two sides simultaneously and make the list, no matter how long and heterogeneous, of those who do the work. 6. Confronted with the accusation of irrationality, we look neither at what rule of logic has been broken, nor at what structure of society could explain the distortion, but to the angle and direction of the observer's <i>displacement</i>, and to the <i>length</i> of the network thus being built. 7. Before attributing any special quality to the mind or to the method of people, let us examine first the many ways through which inscriptions are gathered, combined, tied together and sent back. Only if there is something unexplained once the networks have been studied shall we start to speak of cognitive factors.
	Six Principles
Principles (Latour, 1993, p. 259)	<ol style="list-style-type: none"> 1. The fate of facts and machines is in later users' hands; their qualities are thus a consequence, not a cause, of a collective action. 2. Scientists and engineers speak in the name of new allies that they have shaped and enrolled; representatives among other representatives, these unexpected resources to tip the balance of force in their favour. 3. We are never confronted with science, technology and society, but with a gamut of weaker and stronger <i>associations</i>; thus understanding what facts and machines are is the same task as understanding <i>who</i> the

	Seven Rules of Method
	<p>people are.</p> <ol style="list-style-type: none"> 4. The more science and technology have an esoteric content the further they extend outside; thus, 'science and technology' is only a subset of technoscience. 5. Irrationality is always an accusation made by someone building a network over someone else who stands in the way; thus, there is no Great Divide between minds, but only shorter and longer networks; harder facts are not the rule but the exception, since they are needed only in a very few cases to displace others on a large scale out of their usual ways. 6. History of technoscience is in a large part the history of the resources scattered along networks to accelerate the mobility, faithfulness, combination and cohesion of traces that make action at a distance possible.