Sustainable 'What'?
A Cognitive Mapping Approach to Understanding Sustainable Development

Christine Byrch, University of Otago, New Zealand byrch465@student.otago.ac.nz
Kate Kearins, Auckland University of Technology, New Zealand kate.kearins@aut.ac.nz
Markus Milne, University of Otago, New Zealand mmilne@commerce.otago.ac.nz
Richard Morgan, University of Otago, New Zealand rkm@geography.otago.ac.nz

Abstract

This paper employs a cognitive mapping technique to explore the meaning of sustainable development held by twenty-one New Zealand 'thought leaders' and 'influencers' promoting sustainability, business or sustainable business. These participants' maps illustrated disparate levels of detail and complexity, with from 3 to 51 concepts generated and sorted into a variety of structures. Participants promoting business generally held a *technocentric* approach to sustainable development emphasising the economic domain and the present, and accepting economic growth and development as the key to sustainable development. An *ecocentric* approach to sustainable development with an emphasis on the environmental domain, the future, limits to the Earth's resources, and achievement through various radical means, was more commonly articulated by those promoting sustainability. Those participants promoting sustainable business held elements of both *technocentric* and *ecocentric* worldviews, combining emphasis on the environmental domain, focus on the present, and achievement of sustainable development by various reformist means. These results led to two key observations. First, such divergence of opinion as to what connotes sustainable development across even a small sample does not bode well for its achievement. Second, a clearer elucidation of the worldview of the promoters of sustainable business points to the need to consider more carefully the origins and implications of environmentalism and other aspects of sustainability integrated into a business agenda.

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Introduction

"Sustainable development is one of those ideas that everybody supports but nobody knows what it means." (Sir Jonathon Porritt cited in Financial Times, 1998). Indeed, there is a great deal of confusion as to what 'sustainable development' means (Colby, 1991), with no one agreed definition despite the many proposed. Some authors suggest that sustainable development is dependent on its vague and ambiguous nature (see, for example, Giddings, Hopwood, & O'Brien, 2002). This point is well made by Lele (1991, p 613) who describes sustainable development as:

> a 'metafix' that will unite everybody from the profit-minded industrialist and risk-minimizing subsistence farmer to the equity-seeking social worker, the pollution-concerned or wildlife-loving First Worlder, the growth-maximising policy maker, the goal-oriented bureaucrat, and therefore, the vote-counting politician.

Although it is commonly held that sustainable development includes economic, social and environmental dimensions (see, for example, Elkington, 1997; Stead, Stead, & Starik, 2004) and agreed among many academics and policy-makers that the concept should include matters related to justice, inter-generational and intra-generational equity, the extent of anthropocentricism versus ecocentricism, and a time component (Farrell & Hart, 1998; Hukkinen, 1999a, 1999b; Lele, 1991; Tregidga, 2002), there is considerable variance in interpretation. In one major instance where guidance for interpretation is given, it is frequently ignored by some individuals and groups. The Brundtland definition of sustainable development, arguably the most commonly-cited definition, actually reads:

> Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts:
>
> The concept of 'needs', in particular the essential needs of the world's poor, to which overriding priority should be given; and

> The idea of limitations imposed by the state of technology and social organisation on the environment's ability to meet present and future needs (WCED, 1987, p 43).

When some individuals and groups draw on and claim to cite the Brundtland definition, it is often just the first of the above paragraphs that is quoted, and the latter ones - incorporating the two concepts that give priority to the world's poor and to working within the environment's capacity to meet future needs – are absent. These two concepts express environmental and social points of view which, if accepted, imply broad-ranging and fundamentally challenging responsibilities for the likes of government and business.

Despite the lack of incisive meaning, sustainable development and the related concept of sustainability[1] would seem to have more proponents than ever, with many individuals and organisations - in particular government and business organizations - taking up the 'sustainability challenge' and incorporating their own understanding of sustainable development into various aspects of their operation. In very simple terms, the definitions adopted and their interpretations demonstrate the relative emphasis given to environmental, social and economic domains by different groups and how the concepts of equity, fairness and futurity are applied to those domains (see, for example, Milne, 1996; Norton, 1989; Turner, 1991). There is a substantial body of literature that suggests that the varying emphases in turn reflect individuals' fundamental beliefs about humanity's proper relationship with nature; that is, their environmental 'worldview', be it more ecocentric, technocentric or anthropocentric (see, for example, Colby, 1991; Dobson, 1998; Dryzek, 1997; Eckersley, 1990; Gladwin, Kennelly, & Krause, 1995; MacGregor, 2004). This literature includes both dimensional and categorical worldview schema.

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[1] The terms sustainable development and sustainability are often used interchangeably (as was apparent in the interviews we conducted with participants in this study). See Wackernagel & Rees (1996), Milne (1996), Dryzek (1997) and Welford (1997) for discussions of differences in these terms.

For example, Colby (1991) describes a dimensional schema of five views of 'environmental management in development' ranging from the very strongly anthropocentric 'frontier economics', through 'environmental protection', 'resource management' and 'eco development' to biocentric deep ecology. Turner (1993) describes a categorical schema of very strong and very weak sustainability. Very strong sustainability privileges an ecocentric worldview rejecting almost all use of natural resources and seeing the economy as operating entirely within society, society comprising many parts that do not involve economic activity at all, and social and economic activity totally constrained by the environment. At the other extreme, 'very weak sustainability' is defined by a technocentric worldview of almost infinite substitutability of resources where environmental, economic and social interests compete, although the main priority is maintaining the economy. The sustainable business literature suggests that significant sustainable environmental performance results from a biocentric worldview (Johnson, 1998), although there is little empirical research on this theme.

What do people across the conservative and liberal spectrum understand sustainable development to mean and how disparate is this knowledge? This paper seeks to answer this question using a cognitive mapping technique to explore the meaning of sustainable development held by twenty one of New Zealand's 'thought leaders' or 'influencers' with a role in promoting business, sustainable development, or both.

The paper is organised as follows. First, the terms worldview and cognitive map/ping are examined. Second, the cognitive mapping technique used in this study and the participants are described. Third, the participants' understandings of sustainable development, as presented in cognitive maps, are characterised. Fourth, analysis focuses on how these understandings of sustainable development reflect fundamentally differing worldviews. Finally, conclusions and implications of the analysis are presented.

Cognition, Worldviews and Cognitive Mapping

Cognition is very complex and still largely unexplained. Simplistically defined as "knowing about something… the act of knowing" (Styles, 2005, p 14), cognition is an extremely large field of study covering everything that involves thinking or learning. In studying cognition, researchers examine human cognitive processes through mental representations, without reducing them to a biological or neurological level (Matlin, 2005). To learn a new field, according to the cognitive science approach, is "to build appropriate cognitive structures … and to learn to perform computations … that will transform what is known into what is not yet known" (Posner, 1991, p xi). This cognitive structure, or architecture, is "the central element in a theory of human cognition" (Newell, Rosenbloom, & Laird, 1991, p 98). And "to have a theory of cognition is to have a theory of the architecture" (Newell et al., 1991, p 99). However, cognitive science is very far from defining a verified 'architecture of cognition'. It is, in fact, divided both by theories of architecture and approaches to thinking (Simon & Kaplan, 1991), and as a result, cognitive scientists use a mix of different methods, conceptual approaches, and cognitive architectures.

Fundamental to the cognitive framework or theory of knowledge adopted for this paper is the idea that "knowledge is something that somebody or something knows" (Boulding, 1972, p 50). According to Boulding, knowledge locates a person in time, space, personal relationships, the world of nature and the world of 'subtle intimations and emotions.' A person's subjective knowledge structure is called their image, and this image largely governs behaviour. Messages, consisting of 'structured experiences', are received as information and filtered through a changeable value system. What is important is the meaning of the message, which is "*the change which it produces in the image*" (Boulding, 1972, p 44, emphasis in original). In receiving new information, the image may not change, or it may change a little or it may change radically. Images are resistant to change and the initial response to non-conforming information is to reject the information, rather than to change the image. Part of our image of the world is that this image is also shared with others, who are also part of our image of the world. As

Boulding explains (1972, p 49), "The development of images is part of the culture or the subculture in which they are developed, and it depends upon all elements of that culture or subculture."

In very simple terms, according to Boulding (1972), a person's knowledge is the result of that person's experience, filtered by their values, and held in their personal image. The framework is amended slightly for use in this paper by suggesting that experience is filtered not only by values, but also by other beliefs a person holds, and that this filter is actually a 'worldview'. In essence, then, a person's knowledge of the meaning of sustainable development is the result of experience filtered by their worldview. These worldviews can be accessed through cognitive maps. The terms worldview and cognitive map are used by many authors across many disciplines, such that their meanings are ambiguous, and overlap with the many other terms used to describe knowledge structures[2]. Hence, specific attention is now given to the use of both in this paper.

A worldview comprises an individual's fundamental beliefs about a variety of topics, including the 'proper' relationship between humanity and the natural world, and should be thought of as "a lens *through which* one reads reality" (Koltko-Rivera, 2004, p 8, original emphasis) that "develops over time, mediated by culture" (Koltko-Rivera, 2004, p 37). Worldview beliefs are those "regarding the underlying nature of reality, 'proper' social relations or guidelines for living, or the existence or non existence of important entities" (Koltko-Rivera, 2004, p 5). A worldview is so fundamental and familiar that an individual is usually oblivious to it, and rarely questions or tries to change it (Olsen, Lodwick, & Dunlap, 1992). Changing worldview is "a difficult and slow process of consensus building" (Milbrath, 1984, p 21), to be expected given that changing fundamental beliefs is by all accounts a difficult task (Boulding, 1972; Olsen et al., 1992).

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[2] Hodgkinson and Sparrow (2002) list twenty three constructs, including worldview and cognitive map, describing cognitive knowledge structures in management theory literature alone.

Fundamental to the study of knowledge is the notion that an individual holds that knowledge in structures within their brain, which can be investigated. Many constructs are used to describe these knowledge structures, including mental models, cognitive maps and belief structures. These form the basis of empirical study. The method used in this study is based on conceptual content cognitive mapping (Kaplan & Kearney, 1997), and so the discussion here is limited to cognitive mapping as a research technique.

The term cognitive mapping is variously defined in the literature, perhaps because "the cognitive map idea is often employed more as a metaphor than a theory" (Kaplan & Kearney, 1997, p 584). The definition adopted for this paper is that "Cognitive mapping is a technique that captures an individual's view of a particular issue in a graphical representation" (Tegarden & Sheetz, 2003, p 114)[3]. Cognitive mapping has been widely used across many disciplines in connection with spatial cognition (Csanyi, 1993) and more recently extended to conceptual themes. Accordingly, descriptions of cognitive mapping techniques include both spatial connotations, such as used by geographers (e.g. Downs & Stea, 1973), and conceptual connotations, largely used in the social sciences to understand organisations (Tegarden & Sheetz, 2003), to examine decision making (Axelrod, 1976), to explore meaning (Daniels, Johnson, & deChernatony, 1994; Jacob & Luloff, 1995) and as a tool in education (Bennett & Lehman, 2002).

The objective of conceptual cognitive mapping is usually to assess the structure and content of an individual's knowledge structure, but there is a wide variety of techniques for deriving and analysing these maps. Generally speaking, most techniques comprise three parts: eliciting concepts, refining concepts and identifying relationships between concepts (Tegarden & Sheetz, 2003). Concepts can be elicited from existing documents (Axelrod, 1976), open-ended interviews of research subjects (Bennett & Lehman, 2002), questionnaire responses from research subjects (Robert, 1976) or from the research

[3] While emphasis is given in this definition to graphical representation, we do not limit our understanding to graphs, but include pictorial, visual, and/or diagrammatical representations of thoughts.

participants directly (Kaplan & Kearney, 1997). Relationships are identified using qualitative analysis with scope for rich description, and typically also involve some type of quantitative analysis, on occasion using multivariate techniques (Kaplan & Kearney, 1997). Attributing spatial analogies to non-spatial (conceptual) domains has been criticised by some authors (e.g. Koltko-Rivera, 2005), accordingly, in this instance, care was taken not to overstate the importance of structural dimensions of conceptually-based cognitive maps. The method used to elicit cognitive maps in this study is described in the next section.

Method and Sample

A cognitive mapping exercise was undertaken as part of a series of semi-structured interviews of New Zealand 'thoughtleaders' and 'influencers' promoting sustainability, sustainable business, or business more generally. This paper focuses on the resultant cognitive maps and participant description of them alone, as they were seen to provide a rich and comparable set of data of a type hitherto largely unexplored in the literature on sustainable development. The research method was based on the Conceptual Content Cognitive Mapping (3CM) technique described and used by Kaplan and Kearney (1997) to identify participants' thoughts on car pooling. In this method, knowledge structures were derived directly from participants. Using a written instruction for consistency (see Figure 1), participants were asked to list the concepts important to their understanding of sustainable development on cards, and to then arrange the cards to best represent how they perceived the domain(s) of sustainable development. Despite some initial hesitancy, all participants completed this task and a number later expressed satisfaction with the

> Imagine that you have been asked to share your perspective on sustainable development with a co worker or client who knows little about the subject.
>
> Write each of the concepts that you would talk about on a card.
>
> How will you organise your thoughts? Group the cards in the way that you would present them to show the relationships between these concepts i.e. how they are related in your understanding of sustainable development, and then label the groups.

Figure 1 3CM written instruction

cognitive maps they had produced.

Each arrangement of concepts was photographed (an example is presented in Figure 2) and the concept cards were retained by the interviewers.[4] The exercise was recorded on audiotape as participants tended to talk about their maps, either during construction or once the map was complete, occasionally adding a further concept card or two. Audiotape transcriptions were used to help clarify researcher interpretations where it was not obvious from the written concept card.

The twenty-one participants were drawn from among New Zealand's 'thought leaders' and 'influencers' in the domains of business and sustainability. The basis for participant

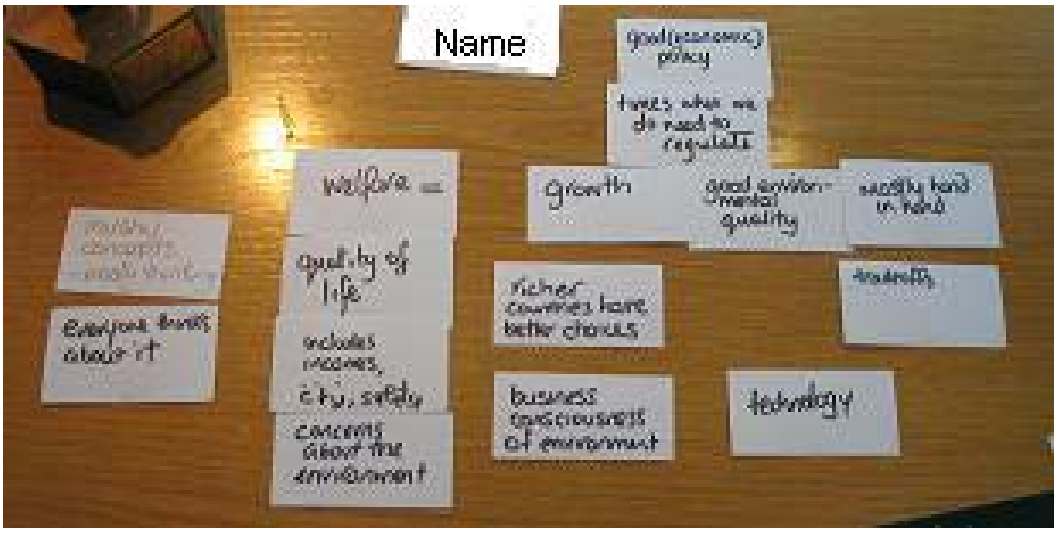

Figure 2 An example of a cognitive map of sustainable development from a participant promoting business

[4] The cognitive mapping technique was piloted and then implemented by one researcher in a series of interviews with a wider sample than that referred to in this paper. A second researcher accompanied the first researcher to one interview to learn the technique and carry out seventeen further interviews. Analysis of the final sample of twenty-one cognitive maps was conducted primarily by the first researcher, and results checked for accuracy by the second researcher.

selection was that the organisation the participants represented supported or promoted either business, sustainable development, or some combination of both, and that the organisation or they personally held a position on sustainable development. Promoters of business and sustainable development were selected, rather than business people themselves, on the premise that the promoters both represented constituent members' points of view and were probably a principal influence in (in)forming that point of view.

Participants generally came from influential government and non-governmental organisations. Given the small size of New Zealand, a reasonable coverage was obtained by listing all likely organisations and selecting a representative from each, in a range of localities. A Google search confined to New Zealand websites using key terms such as 'business' and 'sustainab', plus a search of major New Zealand media aided the process of participant selection.

Participants comprised seven people from each of the following three groups:

- Representatives of seven government and non-governmental organisations promoting **business** in New Zealand. These were chief executives or directors of the New Zealand Business Roundtable, Federated Farmers, the Institute of Directors, Business New Zealand, the Ministry for Economic Development, the National Business Review and the Maori Business Facilitation Service of the Government department of Maori affairs, Te Puni Kokiri.

- Representatives of seven organisations actively promoting **sustainability or sustainable development** in New Zealand. These were the Parliamentary Commissioner for the Environment and key informants within Greenpeace, Royal Forest and Bird Protection Society, Environment and Conservation Organisations of Aotearoa New Zealand, the Ministry for the Environment (New Zealand's central government department responsible for environmental policy) and the New Zealand Green Party. Effort was made within this group specifically to ensure representation of an indigenous/Maori perspective.

- Representatives of seven programmes actively promoting or facilitating **sustainable business** activity in New Zealand. The organisations were the New Zealand Business Council for Sustainable Development, the Natural Step New Zealand, BusinessCare, the Sustainable Business Network, the Sustainable Industry and Climate Group of the Minsitry for the Environment, the Sustainability Working Group of the Institute of Chartered Accountants of New Zealand, and the Council for Socially Responsible Investment.

These groups are referred to as the B Group (Business), the S Group (Sustainability) and the SB Group (Sustainable Business) respectively.

An attempt was made: (1) to derive the 'broad camp' of meaning from the content of cognitive maps of each group of participants and to compare these; (2) to locate these 'broad camps' of meaning within the national political context; and (3) to consider them in the context of worldview. The presentation of results and analysis in the next section generally follows this pattern. Particularly illustrative concepts as noted on participants' concept cards are included below in the presentation of results and analysis, distinguished by italics between single quotation marks, for example *'Impacts of what you are doing'*.

Results and Analysis

The cognitive mapping exercise yielded twenty-one cognitive maps displaying participants' knowledge of the meaning of sustainable development. Participants' cognitive maps illustrated widely variable levels of detail and complexity, with from 3 to 51 concepts sorted into a variety of structures, commonly hierarchical and some with a circular structure.

Each group articulated a distinctly different meaning of sustainable development. This is not to say that all participants of each group articulated exactly the same meaning; rather that they adhered to similar themes that collectively made up what might be termed 'broad camps' of meaning.

The 'Broad Camps' of Meaning

Participants promoting business (the B Group)

The 'broad camp' of meaning presented by the B Group emphasised the economic domain and the notion that a healthy economy with strong development and growth precedes environmental and social improvement and wellbeing. The economic emphasis was implicit in the language of the concept cards *('the most important responsibility a business has is to grow and prosper'*, *'this is a business issue')* and the notion that the environment could be accounted for in business terms (*'environmental capital')* and discussed in the language of business (*'prioritising resources'*, *'tradeoffs', 'maximum returns')*. The B Group believed a strong economic system (*'good (economic) policy, 'market focus', 'growth', 'development')* and regulation (*'science based regulation systems', 'times when we need to regulate')* would achieve sustainable development, and expressed faith in *'efficient use of resources', 'future technologies'* and *'renewables'* to ensure that growth was not limited by a shortage of nature's resources. Whilst recognising that maintaining environmental quality was necessary to ensure humanity's wellbeing (*'good environmental quality', 'doesn't impact environment in a way that has long term degradation'*), the group generally acknowledged that environmental change was acceptable or inevitable (*'without too negative an impact', 'evolve with our environment')*. Sustainable development was very much located in the present, with little concern for the future, noting only that business must work to a longer timeframe to achieve sustainable development (*'end goal within given time frame'*, *'longer term timeframes')*. Consequently, the few mentions of the goal of sustainable development were also focused in the present, and concerned with wellbeing and quality of life (*'welfare=quality of life', 'wellbeing'*) although the benefits of a strong economy were not seen as universal (*'richer countries have better choices'*, *'capitalism involves enlightened self interest'*, *'business does have a role to act responsibly with regard to these stakeholders')*.

Participants promoting sustainable development (The S Group)

The 'broad camp' of meaning presented by the S Group emphasised the dependence of humanity on the environment, with the purpose of providing now for humanity's future generations, with some extending this notion to other species (*'sustaining all other types of living things and therefore the ecosystems that they depend on', 'biodiversity is important – intrinsic value'*). The S Group recognised humanity's place within, and its dependence on, the environment (*'forests and oceans as if our lives depend on them because they do'*, *'humans are part of the ecosystem not separate from it'*, *'environment as foundation for everything else', 'appreciate we are part and parcel of environment'*) and believed the environment had a finite capacity to provide resources (*'living within the limits of nature', 'world is finite'*) and to assimilate waste (*'sustainable usage is staying with regeneration capacity given ecosystem needs', 'many ecosystem services are failing'*). Concepts of justice, equity and fairness were included both as a current problem (*'people issues – development, human rights skills, exploitation'*) and as a requirement for sustainable development (*'be fair and equitable'*, *'family, elders – look after'*, *'equity – people, non human'*, *'respect for the environment and for each other'*). Three ideas were expressed with respect to futurity. These were that sustainable development was for the benefit of future generations (*'future generations – tomorrow's child')*; activities now should not limit options for the future (*'ability to continue an economic activity forever')*; and, perhaps most interestingly, the notion of learning from the past (*'values of ancestors (best and evolving) links to the past'*) espoused by an indigenous/Maori participant. Consequently, the goals of sustainable development reflected humanity's survival and future, rather than just present wellbeing (*'longevity', 'endurance', 'survival of our species', 'sustaining human wellbeing, values and relationships', 'maintaining human wellbeing'*).

Several views were expressed as to how sustainable development should be achieved including living harmoniously with and learning from the environment (*'respect for the environment and for each other', 'live in peace and share resources', 'mimic nature – cyclic, benign')*; reforming economic and political systems ('*economic system –*

measuring and valuing indicators of social and environmental sustainability – not just GDP', 'interrelationships between social goals, economic and wealth goals', 'institutions and institutional design', 'close gaps between decisions and individuals'); consciously living within nature's capacity to both supply resources and to assimilate wastes (*'not about growth', 'living within limits', 'should be trying to produce what we need out of less – not more', 'problem of consumerism'*); and by public action (*'extremely challenging roles for everyone citizens and parents interdependent', 'campaigns', 'mobilising people', 'vigilante consumers'*).

Participants promoting sustainable business (The SB Group)

Cognitive maps of the SB Group of participants were more difficult to characterise. The environmental domain was emphasised, although economic ('*profitable business'*) and social ('*inclusive social policies, participate and belong'*) outcomes were also important to some. Participants recognised both social problems ('*widening gap between rich and poor', 'continue fighting e.g. Iraq war'*) and environmental problems ('*recognise planet not in good health'*). There was no mention of the goal of sustainable development, although meaning was placed in the present. There was only one mention of limits ('*crunch point on oil production')* and no specific mention of technology. Various means were suggested for achieving sustainable development including: implementing solutions to resolve environmental problems and other unsustainable activities (*'ecological footprints', 'organics', 'strategies for the world', 'risk management', 'cleaner production'*); a political system aligned with inclusive and improved social outcomes; an economic system that operates entirely within social and environmental domains ('*producers/manufacturers – people – processes – capital'*); and behaviour change, often aligned with moral principles (*'ethical consumption', 'what can I do about it to change it for the better?', 'conscience – standards and values', 'virtues'*).

Comparing the 'Broad Camps' of Meaning

The 'broad camps' of meaning articulated by the three groups were distinctly different, the only area of agreement being an anthropocentric goal - that is that humanity would in

some way, at some time, benefit from sustainable development. The differences are illustrated by each group's interpretation of five themes: the goal of sustainable development; whether sustainable development is focused in the present or future; the emphasis on the environmental, economic and social domains; the importance of justice, equity and fairness; and the means for achieving sustainable development. The most distinguishing characteristics of the B Group were a focus on the economic domain, a focus on the present and faith in economic growth to achieve sustainable development. The most distinguishing characteristics of the S Group were a focus on the environmental domain and the future, and radical means of achieving sustainable development. The most distinguishing features of the SB Group were a focus on the present together with a focus on the environmental domain, and a mix of less radical (i.e. reformist and incrementalist) means to achieve sustainable development. These interpretations are presented in Table 1.

That those participants promoting business, the B Group, articulate a meaning of sustainable development analogous to Turner's (1993) model of very weak sustainability is no surprise. This view has been very clearly stated on many occasions by the Executive Director of one of the nation's most influential business lobby groups, the New Zealand Business Roundtable, and a participant in this study. The Roundtable is 'on the side of sustainable development' and equates the goal of sustainable development with the goal of economics - "to maximise the value to society of the use of scarce resources" (Kerr, 2002, p 3). It argues the best way for people to meet their needs is to have money to spend on food, shelter, health, education etc, and therefore the prime duty of business is to create shareholder value, which is best achieved by a free market economy, together with private property rights, the rule of law, freedom of contract, third party liability and free trade. Kerr subscribes to the notion that poverty is the worst polluter, and states that environmental progress will follow economic development.

Table 1 Interpretation of five themes by the three groups of participants.

	The B Group (Promoting Business)	**The SB Group (Promoting Sustainable Business)**	**The S Group (Promoting Sustainability)**
Goal of sustainable development	Present wellbeing	-	Long term survival and wellbeing
Present or future focus	Present	Present	Future
Domain emphasis	Economic	Environmental; social; environmental, social and economic	Environmental; environmental and social; environmental, social and economic.
Importance of fairness, justice and equity	No	No	Yes
Means for achieving sustainable development	Economic prosperity; regulation; technology	Solve social and environmental problems; change behaviour; realign political and social systems	Reform economic and political systems; mobilize public; live within nature's limits; mimic nature; live in peace

The meaning of sustainable development articulated by the S group is analogous to Turner's model of strong sustainability. This ecocentric view has been clearly expressed by the Parliamentary Commissioner for the Environment (PCE), arguably the most influential proponent of sustainable development in New Zealand, and another participant in this study. The PCE believes: that the economy is a subset of society, and both are totally constrained by and dependent on the natural systems of our planet; that there are finite reserves of non renewable resources; that there are limits to the extent that nature's life-supporting systems are able to accommodate human activity; that environmental, social and economic factors are interlinked and must all be considered in decision making; and that the wellbeing of current and future generations is a key consideration (PCE, 2002).

A further distinction differentiates the B and S Groups. Meaning articulated by the B Group was remarkably consistent, in particular with regard to achieving sustainable development through economic growth. Meaning articulated by the S Group was less consistent, most obviously with regard to how to achieve sustainable development. This difference in consistency may be explained by two observations. First, the modern environmental movement is "an extraordinarily diverse phenomenon encompassing a wide range of often conflicting philosophical perspectives." (Eckersley, 1990, p 68). And second, the present economic model, which drives weak sustainability, has had a lengthy opportunity to become 'entrenched in our collective psyches', whereas strong sustainability remains essentially hypothetical. As Gladwin et al. (1995, p 876) point out, "Definitional diversity is to be expected during the emergent phase of any potentially big idea of general usefulness" such as sustainable development.

Indeed, this difficulty in envisioning sustainable development (perhaps because of the problems posed in acknowledging the perceived threat to current modes of operation by so doing) is possibly the reason for the ubiquitous scarcity of guidance on implementing sustainable development. A case in point is the New Zealand Government. Despite producing a 'Programme of Action' (DPMC, 2003), the Government presents few ideas by which New Zealand will achieve sustainable development (as opposed to environmental management) beyond such notions as "seeking innovative solutions that are mutually reinforcing, rather than accepting that gain in one area will necessarily be achieved at the expense of another." (DPMC, 2003 p 10). Nor is it clear how apparently conflicting outcomes will be managed – how, for example, future New Zealanders will "derive considerable value from our natural advantages in terms of resources", whilst at the same time managing to "cherish our natural environment [and] are committed to protecting it for future generations"(DPMC, 2003 p 9).

Participants promoting sustainable business, the SB Group, articulate a meaning of sustainable development somewhere between those of the S and B Groups. And indeed, the New Zealand Business Council for Sustainable Development (NZBCSD), possibly the most influential of all those promoting sustainable business in New Zealand,

explicitly positions itself within this middle ground. The NZBCSD states that "those who maintain that the fundamentalist free-market route is the best and only way and that the only role of business is to make profits are missing a real opportunity. Similarly, those on the green left who believe that the business model is inherently selfish and that business is 'doing sustainability' for the wrong reasons, fail to recognize the real contributions which companies can and are making." (NZBCSD, 2005, p 1). The NZBCSD believes that "the middle path is the best choice for business because sustainability is not just a nice to have, it's a business imperative." (NZBCSD, 2005, p 2). And certainly there is evidence to support this view. For example Livesey (2001), in her discussion of Royal Dutch Shell, sees that company as benefiting from espousing the discourse of the middle ground.

Meaning in the Context of Worldview

The 'broad camps' of meaning are indicative of the worldviews held by participants, and through which they 'read reality'. Speaking very generally, the B Group holds a technocentric worldview in which, as was so well put by Sachs (1999, p 34), sustainable development "emasculates the environmental challenge by absorbing it into the empty shell of development." The S Group holds an ecocentric worldview, in which participants are united in challenging "the cornucopian assumptions and technologically optimistic aspirations of the post-World War Two growth consensus" (Eckersley, 1990, p 69). More interesting, perhaps, is to consider how the worldview articulated by the SB Group, with elements of both technocentric and ecocentric worldviews, has arisen.

Perhaps the 'broad camp' of the SB Group represents a worldview somewhere between those of the B and S Groups - several authors describe intermediate worldviews between two poles (Jamison, 2001; Milbrath, 1984; Olsen et al., 1992). These intermediate worldviews may be static, as are the 'environmental sympathizers', midway between the 'environmental reformers' and 'traditional material wealth advocates', described by Milbrath (1984). Or they may be an evolving position, such as the evolution of the middle ground from 'environmental protection', to 'resource management' to 'eco development', described by Colby (1991), between the extreme views of strongly

anthropocentric 'frontier economics' and bio-centric 'deep ecology'. The 'broad camp' of the SB group could be a synthesis of those of the S and B Group camps, as the work of Gladwin et al (1995) would suggest. These authors label technocentric and ecocentric worldviews as thesis and antithesis respectively, and describe a new worldview – sustaincentrism – as a synthesis of the two. This trichotomy is presented as 'heuristically useful' and schematic rather than 'photorealistic' (Gladwin et al., 1995), and indeed it is the schematic, rather than the detail, that is of note in this instance.

It is not possible to determine from the current study how the worldview of the SB Group arose. Its origin and its implications, however, are important, and are worthy of further research.

If the worldview of the SB Group represents genuine movement from a technocentric toward an ecocentric worldview, then it would seem to hold some promise. However, changing the beliefs that comprise an individual's worldview, and so changing worldview, is extremely slow and difficult (Boulding, 1972; Olsen et al., 1992), particularly whilst the individual is immersed in the culture or sub culture from which the beliefs were adopted, and is associated with others sharing that worldview (Boulding, 1972). So, if this movement of the SB Group is more rhetorical than embraced in action and change on the part of business, there may be substance for the concerns of George Monbiot (2002, p 53) that "Environmentalism, like almost everything else, is in danger of being swallowed by the corporate leviathan. If this happens, it will disappear without trace. No one threatens its survival as much as the greens who have taken the corporate shilling." Welford (1997, p x) reiterates Monbiot's first concern as 'hijacking the environmental agenda', and notes "there are a lot of people (and businesses) who profess to know a lot about environmental issues and claim to have the answers. We must be very wary of those who offer simplistic solutions to complex problems, especially when their wider agendas are unclear." Welford's concern is that business will focus on a narrow environmental aspect of sustainable development, which is consistent with traditional financial priorities, and requires little change to the status quo. For example, it has been suggested that the pragmatic approach to solving environmental problems

adopted by business, equates with "maintaining economic growth and success …, entering alliances and agreements with specific stakeholders and ensuring low levels of societal confrontation." (Prasad & Elmes, 2005, p 863).

It is also possible that the SB Group has adopted a technocentric rhetoric to facilitate describing sustainable development to business. According to MacGregor (2004), "The power of sustainable development is self-sustained through normalisation of particular languages and modes of expression". Using 'the language of business' and the business case (based on economic rationality) to entice business to adopt sustainability principles, as do the programmes that promote and facilitate sustainable development in New Zealand business (BusinessCare, 2005; NZBCSD, 2003; SBN, 2005; TNS, 2005), risks disempowering and de-radicalizing the environmental and social imperatives of sustainable development. To maintain the power of sustainable development, as Shrivastava (1994, p 706) suggests, "Instead of understanding 'the environment' from an organisational viewpoint, we need to understand 'the organisation' from an environmental viewpoint."

The implications of adopting particular environmental worldviews are important. Dryzek (1997, p 9) points out that "the way we construct, interpret, discuss and analyze environmental problems has all kinds of consequences". The most significant consequence regarding sustainable development is that despite considerable rhetoric, there seems to have been little progress in actually achieving it. This certainly is the case in New Zealand, as confirmed by the Parliamentary Commissioner for the Environment in his 2002 statement that sustainable development "has not progressed in New Zealand in a coordinated and meaningful fashion over the last 10 years" (PCE, 2002, p 3). This lamentable state could well have derived from the aforegoing analysis which aligns with Porritt's (2004, p 60) suggestion of a problem of "culture clash", whereby because of the differences in meaning "the experience of protagonists on both sides of this particular fence (the investment community and the sustainable development community) has predominantly been one of mutual incomprehension, conceptual disconnection and flawed discourse".

Conclusion

This paper contributes to empirical research on environmental worldview, generated mostly within the environmental psychology literature which has barely penetrated discussion of sustainability within the management and business literature. It shows cognitive mapping to be a useful technique for investigating the meaning of conceptual themes like sustainable development.

Individually, the 'thought leaders and influencers' in this study articulated quite specific ideas as to what sustainable development means, indicating some 'progress' since Porritt's statement of 1997 that: "Sustainable development is one of those ideas that everybody supports but nobody knows what it means". However, it seems that progress towards understanding sustainable development serves mainly to institutionalise several distinctly different and largely competing views, despite some overlap. Participants concur with the notion that the goal of sustainable development is to do with humanity's existence, although more pertinent are the differences. Those promoting business articulated a meaning of sustainable development consistent with a technocentric view of the world; those promoting sustainable development articulated a meaning consistent with an ecocentric view of the world; whilst those participants promoting sustainable business articulated a meaning combining elements of both views.

The problem of 'culture clash' remains whereby promoters of business hold a fundamentally different meaning of sustainable development from those promoting sustainable development. Such divergence in opinion as to what sustainable development means, and how to achieve it, across even this small sample of New Zealand's thought leaders and influencers, does not bode well for its achievement.

It is possible that, as Jamison suggests (2001), the meaning held by those promoting sustainable business, with elements of both the technocentric and ecocentric worldviews, manifests ideas of the proponents of sustainable development 'working their way into the lifeblood' of the proponents of business. But the opposite is also possible, in which case, the view of those promoting business, development and growth may disempower the

meaning of sustainable development. Research into the origins of an environmental worldview within business and at an individual level (for example, as to what experiences or exposure promote particular worldviews among different groups) would help to resolve this inquiry, while further research on its implications is ongoing.

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