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**UNDERSTANDING THE ANTECEDENTS OF EMPLOYEE  
SUSTAINABILITY BEHAVIOURS: MEASURING AND THEORISING  
SELF- AND COLLECTIVE EFFICACY FOR SUSTAINABILITY**

by

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## ABSTRACT

Organisations are increasingly committing to ambitious new environmental and social sustainability goals that will necessitate employees across the organisation changing their workplace behaviours. While both practitioners and scholars recognise the benefit of integrating sustainability into everyday work, we have less of an understanding about the antecedents of employees' sustainability behaviours. The psychological literature identifies efficacy – the perception of one's own ability (self-efficacy) and one's group's ability (collective efficacy) to complete a task successfully – as a measurable predictor of behaviour. It also empirically identifies efficacy builders and theorises judgements that give rise to efficacy. Yet, efficacy (at least that which is strongly predictive of behaviours) is task specific and we lack constructs for self- and collective efficacy for sustainability (SES and CES), and their corresponding measures. We also lack an empirically grounded understanding of the judgements that give rise to an individual's SES and CES. This results in two questions: 1) How do we define and measure SES and CES, and 2) what are the judgement factors that lead to SES and CES? To address the first question, I defined these constructs and developed and refined two scales (one each for SES and CES). I undertook preliminary item testing and refinement, assessed scale reliability and validity (Cronbach's alphas of 0.926 for SES and 0.941 for CES), and established construct, convergent and divergent validity through two rounds of testing with acceptably-sized samples. I then trialled the scales in a live corporate environment (Finco) with 781 respondents, further establishing face validity and practical workability. I also conducted a smaller test with MBA students (n=72) to collect qualitative data related to the scales' items. The result is an abbreviated five-item version and a full nine-item version of each of the SES and CES scales, accompanied by implementation guidance. To address the second question, I analysed the qualitative data collected during the scale trialling, as well as data from twelve interviews with Finco and MBA survey respondents. This resulted in a model highlighting eight judgement factors that give rise to SES and four for CES. I thus offer a scholarly and practically relevant set of constructs, measures, and antecedents to assess and enhance employees' efficacy for sustainability behaviours.

*Keywords: sustainability, behaviour change, self-efficacy, collective efficacy, sustainability integration, organisational sustainability*

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## **LIST OF ACRONYMS AND ABBREVIATIONS**

CES	Collective Efficacy for Sustainability
CFA	Confirmatory Factor Analysis
CS	Corporate Sustainability
CSR	Corporate Social Responsibility
EFA	Exploratory Factor Analysis
JSE	Johannesburg Stock Exchange
NGO	Non-governmental organisation
NGSE	New General Self Efficacy Scale
NPO	Non-profit Organisation
OCB	Organisational Citizenship Behaviours
OCBE	Organisational Citizenship Behaviours for the Environment
OET	Outcome Expectancy Theory
SEEC	Sustainable Enterprise and Emergent Change
SES	Self-Efficacy for Sustainability
SET	Social Exchange Theory
SFU	Simon Fraser University (Canada)
SIB	Sustainability Integration Behaviour
SLT	Social Learning Theory
SCT	Social Cognitive Theory
PEB	Pro- Environmental Behaviours
PCA	Principal Component Analysis

TPB Theory of Planned Behaviour

UCT University of Cape Town (South Africa)

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## CHAPTER 1: INTRODUCTION

“If I have the belief that I can do it, I shall surely acquire the capacity to do it even if I may not have it at the beginning.”

Mahatma Gandhi

Companies are under growing pressure to improve their environmental and social sustainability performance (Baumgartner & Zielowski, 2004; Collier & Esteban, 2007; Crane, 2000; Erdogan, Bauer, & Taylor, 2015; Hahn, Figge, Aragón-Correa, & Sharma, 2017; Starik & Marcus, 2000). While executives are increasingly acknowledging the potential value of sustainability to their companies (Dixon-Fowler, Slater, Johnson, Ellstrand, & Romi, 2012; Ethical Corporation, 2016; Jackson, Ones, & Dilchert, 2012b), they still struggle with integrating sustainability into company practices (Bertels, 2010; McKinsey & Company, 2014). Accomplishing sustainability integration will require the cooperation of employees to make changes in their everyday work processes (Norton, Zacher, & Ashkanasy, 2012; Ramus & Steger, 2000; Robertson & Barling, 2013). While both practitioners and scholars recognise the benefit of integrating sustainability into everyday work (Baumgartner, 2009; Baumgartner & Ebner, 2010; Bertels, 2010; Ceres, 2010; Linnenluecke, Russell, & Griffiths, 2009; Paraschiv, Nemoianu, Langa, & Szabó, 2012; Schneider, Brief, & Guzzo, 1996), we have less of an understanding about the antecedents of employees' sustainability behaviours (Lo, Peters, & Kok, 2012; Paillé & Raineri, 2015; Russell & Griffiths, 2008; Sharma, 2002). Managers seeking to implement sustainability in their organisations would benefit from a better understanding of what affects employees' propensity to take on new sustainability related tasks. To address these scholarly and practical needs, I developed the constructs of, and corresponding scales for, self-efficacy for sustainability (SES) and collective-efficacy for sustainability (CES), and I theorised a model of the judgement factors contributing to SES and CES.

Extensive prior research in fields such as education (Effeney & Davis, 2013; Goddard, 2002) and health (Garcia, Schmitz, & Doerfler, 1990; Manning & Wright, 1983; O’Leary, 1985) has demonstrated that both self- and collective-efficacy (Bandura, 1982), are strong predictors of future behaviour. When individuals perceive that they (self) or their group (collective) are able to undertake a task successfully, they are more likely to subsequently engage in that task. My research empirically identifies and theorises on the judgements factors that give rise to self- and collective efficacy for sustainability.”

In this thesis, I built upon the efficacy literature to further our understanding of the antecedents of sustainability behaviours. Recognising that efficacy is highly domain and task specific (Bandura, 2011), I developed the constructs of self-efficacy for sustainability (SES) and collective efficacy for sustainability (CES). I asked first, how do we define and measure SES and CES, and second, what are the judgement factors that lead to SES and CES? To address these questions, I developed and validated scales for SES and CES, and then conducted a configurational analysis to identify employees’ judgement factors for SES and CES.

I first followed a standard scale development process. I established the domain of interest; reviewed literature relevant to organisational sustainability, efficacy and scale development; developed items; and engaged in an iterative item refining process. I conducted five research phases to establish the statistical requirements for face, content, construct, divergent and convergent validity. I ran exploratory and confirmatory factor analyses, which allow for the reduction of the number of items. Factor analysis revealed the viability of the following SES factors: Capacity, Resilience, Understanding and Positive outlook; and CES factors: Collaboration, Vision, and Resilience. I trialled the scales in a

large listed company, Finco<sup>1</sup>, and among a sample of MBA students, to further enhance their validity and usefulness in diverse organisational contexts. I ultimately developed and validated a shorter ten-item and a longer eighteen-item survey, both exhibiting solid psychometric properties. A set of scales is efficiently and quickly to be able to measure and identify where areas of weakness and progress for SES and CES are likely to arise among employees. Scales are efficient and less time consuming than other types of analysis in large organisations.

To address the second question, I conducted a configurational analysis using the qualitative data collected during the scale trialling, as well as data from twelve interviews with Finco and MBA survey respondents. This resulted in a model highlighting eight judgement factors that give rise to SES and four for CES.

This work contributes to theory by developing and elaborating a novel and useful theoretical construct – efficacy for sustainability – and by proposing a model identifying the judgement factors that give rise to SES and CES. It makes an important methodological contribution to scholarship by developing and validating scales for the measurement of SES and CES. These theoretical and methodological contributions are also very relevant to practice. Using the scales, survey results should provide practitioners with a measure of the likelihood of employees enacting sustainability behaviours, and armed with this information practitioners can focus sustainability programme interventions where they are needed most. Identifying employees’ judgement factors practically assists managers in focusing on the personal and contextual factors that are likely to build strong efficacy for sustainability.

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<sup>1</sup> Finco is a pseudonym to protect participants’ confidentiality.

My thesis proceeds as follows. In Chapter 2, I situate my work within the existing body of research investigating organisational sustainability and employee behaviour change, the constructs of self and collective efficacy, as well as other related constructs. In doing so, I clarify how I conceptualise the new constructs of self- and collective efficacy for sustainability. In Chapter 3, I address my first research question with a focus on scale development. I describe the research design, data collection, quality assurance, and the validation of the scales. I combine the methodological and empirical accounts of the scale development process in a chronological manner, to ensure coherence and allow for clearer reading. In my exploration of the judgement factors in Chapter 4, I describe the qualitative interview processes and configurational analysis before describing my theorised model of antecedents of SES and CES. In Chapter 5, I discuss how my findings contribute to scholarly work on employee behaviour change for sustainability, how they might influence future theoretical and empirical work, and how they contribute to practice.

## **CHAPTER 2: THEORETICAL BACKGROUND**

In this section, I review prior work on embedding organisational sustainability, self- and collective efficacy theory, related constructs, and scale development theory in order to be clear about how I conceptualise these concepts and to situate my thesis within prior work.

### **2.1 Embedding Organisational Sustainability**

Although there are many definitions and interpretations of the broad and evolving construct of sustainability (Gladwin, Kennelly, Krause, & Kennelly, 2009) the aim of this section is to describe and discuss those concepts most relevant to this research. The evolving consensus in sustainability is that there are three pillars: the economic, social and environmental (Elkington, 1998; Rondinelli & Berry, 2000; Bansal, 2005). These pillars are reflected in the definition I used in this study, including with survey respondents:

*'a business approach that drives long-term corporate growth and profitability through proper consideration of environmental and social impacts, and good governance'*

As an alternative to the traditional profit-maximisation model, corporate sustainability (CS) is a management paradigm where human and natural capitals are deemed as important as corporate growth and profitability (Wilson, 2003). As explained by Jennings and Zandbergen (2010), the problem with the current state of business is that organisations act in a global economic system that is seen to be independent of the planetary ecological system, seeking out unlimited markets to exploit and exhaust. According to the ecological view, organisations act in an economic system that is inextricably intertwined with and reliant on the social and ecological system; every action having greater social and ecological consequences (Jennings & Zandbergen, 2010).

In order to integrate values for sustainable business into their strategic processes organisations need to develop shared perceptions about their relationship with the natural environment and how it will affect their long-term survival (Stead & Stead, 1994). This includes perceiving the physical limits of the Earth, the interconnectedness between themselves and the ecosystem, and the true, long-term ecological implications of their strategic choices (Stead & Stead, 1994).

Many organisations, finally grasping the concept of their ecological embeddedness, are now engaging in embedding sustainability practices. Management would benefit from a performance measurement to determine how well they are executing on these strategies and to make any necessary corrections (Kaplan & Norton, 2008). Eccles, Ioannou, & Serafeim (2014) found that 'High Sustainability'<sup>2</sup> companies are more likely to measure information related to key stakeholders such as employees, customers, and suppliers – and to increase the credibility of these measures by using auditing procedures. Additionally, information is a crucial asset required for effective strategy execution by management, as well as the effective monitoring of this execution by the board (Eccles et al., 2014). 'High Sustainability' organisations not only measure, but also disclose more non-financial data (Eccles et al., 2014) .

Sustainable strategy execution requires behavioural change by employees, thus the participation and personal engagement of employees is essential (Boiral, 2002; Eccles, Perkins, & Serafeim, 2012; Paillé, Mejía-Morelos, Marché-Paillé, Chen, & Chen, 2016; Paul & Nihan, 2012). Employee participation can have a significant impact on changing working

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<sup>2</sup> "High Sustainability" refers to companies with a substantial number of environmental and social policies adopted for a significant number of years.

routines, affecting behaviour and increasing environmental consciousness (Remmen & Lorentzen, 2000).

Since the 1970s researchers have been attempting to develop theoretical frameworks to explain the gap between individuals having environmental knowledge and awareness, and exhibiting pro-environmental behaviour (Kollmuss & Agyeman, 2002). Kollmuss and Agyeman (2002) describe the most influential and commonly used frameworks for analysing pro-environmental behaviour as: early US linear progression models; altruism, empathy and prosocial behaviour models; and sociological models. After reviewing these approaches they conclude that what shapes pro-environmental behaviour is so complex that it cannot be visualized in one single framework or diagram, but attempt to pull a model together nonetheless. More recently employee green behaviour (EGB): a workplace-specific form of pro-environmental behaviour has entered the research arena (Norton, Parker, Zacher, & Ashkanasy, 2015). Ones and Dilchert, (2012) define EGB as any measureable individual behaviour that contributes to or detracts from environmental sustainability goals in the work context. Research on green behaviour in the workplace (see Paillé & Boiral, 2013; Ramus & Steger, 2000) has typically conceptualized it as voluntary behaviour. Introducing EGB has expanded to recognise that not all EGB is discretionary (Jackson, Ones, & Dilchert, 2012a). Norton et al (2015) identify four distinct theoretical approaches in the EGB study: (1) attitudinal, (2) normative, (3) exchange, and (4) motivational. Within the attitudinal theories, Azjen's (1991) theory of planned behaviour is one of the most well-known frameworks for explaining both private (Bamberg & Möser, 2007) and work contexts environmental behaviour (Unsworth, Dmitrieva, & Adriasola, 2013). This theory is discussed in more detail in section 2.3.5. Normative theories focus on the extent to which a behaviour is perceived to be socially acceptable (Norton, Zacher, & Ashkanasy, 2015). As an example, Norton et al. (2014) examined employee perceptions of organisational norms to explain EGB. Under exchange theories which focus on the role of interactions, social exchange theory has recently been applied

to explain the nature of environmental citizenship behaviour (OCBE) (Paillé & Boiral, 2013; Paillé, Boiral, & Chen, 2013; Paillé, Mejía-Morelos, Marché-Paillé, Chen, & Chen, 2015). I discuss OCBE in more detail in section 2.3.3. Motivation theories are focused on the factors that drive the decision to engage in specific behaviour, and the intensity and persistence of effort demonstrated. Examples include Outcome Expectancy Theory and Reinforcement Theory (see section 2.3.4 and 2.3.6). There are an additional number of motivational theories which are instrumental in explaining the triggers that cause individuals to act. Drawing on one of these (efficacy theory) and heeding the calls for greater information, I propose that the measuring of two new constructs, self- and collective efficacy for sustainability, could provide useful information on employees' propensity to engage in sustainability behaviours. I discuss efficacy theory next in the light of the organisational requirement for tools to facilitate the embedding of sustainability behaviours in everyday work processes.

## **2.2 Efficacy Theory**

Self- and collective efficacy are 'future-oriented judgments about capabilities to organise and execute the courses of action required to produce given attainments in specific situations or contexts' (Bandura, 1997), the proverbial, 'I think I can'. While self-efficacy refers to beliefs held by and about the individual, collective efficacy is the shared belief among members of a group that their group or organization is equipped to cope effectively and efficiently with the demands, challenges, stressors, and opportunities they face (Bohn, 2010).

Self- and collective efficacy are best understood in the context of social cognitive theory (SCT). SCT is an approach to understanding human cognition, motivation, action and emotion based on the premise that we are active shapers of our environments, rather than merely passive reactors (Bandura, 1986, 1997; Barone, Maddux, & Snyder, 1997). In simple terms, SCT views an individual as self-organizing, self-reflecting, self-regulating,

and proactive (Bandura, 1989), and concerns the capacity to exercise control over the nature and quality of one's life (Bandura, 2001). In agentic transactions, people are producers, as well as products, of social systems (Bandura, 2001). SCT distinguishes among three types of agency: direct personal agency, proxy agency that relies on others to produce a desired outcome on one's behalf, and collective agency exercised through socially coordinated and interdependent effort (Bandura, 2001).

Although human agency theory had focussed almost exclusively on personal influence exercised individually (self-efficacy), Bandura (2000) challenged this noting that people do not live their lives autonomously. Many outcomes that people seek are attainable only through interdependent efforts, requiring working together to secure what they cannot accomplish on their own. Hence the development of collective agency, with a key ingredient being people's shared beliefs in their collective power to produce desired results, or, as it is more succinctly called, collective efficacy (Bandura, 2000).

### **2.2.1 Self-efficacy**

Self-perceptions of efficacy are the most important determinants of the behaviours individuals choose to engage in and how much they persevere in their efforts in the face of obstacles and challenges (Maddux, 2000). Bandura (1982) explains that self-efficacy influences our thought patterns, actions, and emotional arousal. Additionally, it plays a major role in how goals, tasks, and challenges are approached. In causal tests, the stronger the level of self-efficacy, the higher the performance accomplishments, and the lower the emotional arousal (Bandura, 1982).

Bandura's (1982) theories provide an explanation for why people often do not behave optimally, even though they know full well what to do. He explains this is due to self-

referent<sup>3</sup> thought, which mediates the connection between knowledge and action. Unless people believe that they can deliver desired effects and prevent undesired ones by their actions, their motivation to act is limited (Bandura, 2000). The ability to think about future consequences of one's action provides a source of motivation, and the negative assessments of potential inadequate performance provide incentives for action (Bandura, 1977).

Perceptions of self-efficacy acts as a strong determinant of how much effort people will expend, and how long they will persevere in the face of obstacles, or negative experiences (Bandura, 1982). In difficult circumstances, those with serious doubts about their capabilities slacken their efforts or give up altogether, whereas those who have a strong sense of efficacy make an even greater effort to master the challenges (Bandura, 1982). Efficacy beliefs play a significant role in the self-regulation of motivation (Bandura, 1995). It takes strong self-efficacy to remain focussed on a task under demanding situations (Bandura, 1993), especially if failure has negative social consequences – a state colloquially known as 'big match temperament'. Interestingly, in most cases, slightly overestimating one's actual capabilities has the most positive effect on performance (Goddard, Hoy, & Hoy, 2004). It may be useful to identify employees with strong self-efficacy to champion new and challenging projects, such as spearheading sustainability programmes, due to their resilience in the face of resistance towards change.

Perceived self-efficacy can be characterised as competence-based, prospective, and action-related (Luszczynska, Gutiérrez-Doña, & Schwarzer, 2005). People process, evaluate, and integrate various sources of information regarding their capability, and from

---

<sup>3</sup> Self-referential processing is the cognitive process of relating information, often from the external world, to the self. Self-focus refers to attention directed inwardly, to the self, as opposed to the external world.

this they regulate their choice behaviour and efforts accordingly (Bandura, 1977). Self-efficacy can be the difference between possessing knowledge and skills, and being able to use them well under difficult conditions (Bandura, 1993). Bandura (1993) explains that simply understanding factual knowledge and a way of operating is not adequate for effective intellectual functioning. He proposes that self-regulatory processes determine human development and adaptation (Bandura, 1993). This may explain some of the frustrations with the change work involved with embedding sustainable behaviours into the workplace. Even where management may have implemented processes, policies, frameworks and infrastructure to encourage and facilitate employees to enact sustainable behaviours, the desired behaviours still may not result due to a lack of positive self-regulatory processes, such as self-efficacy.

### Sources of self-efficacy

Bandura (1986, 1997) hypothesized four sources of self-efficacy builders: mastery experience, vicarious experience, social persuasion, and affective state. I discuss each on turn below.

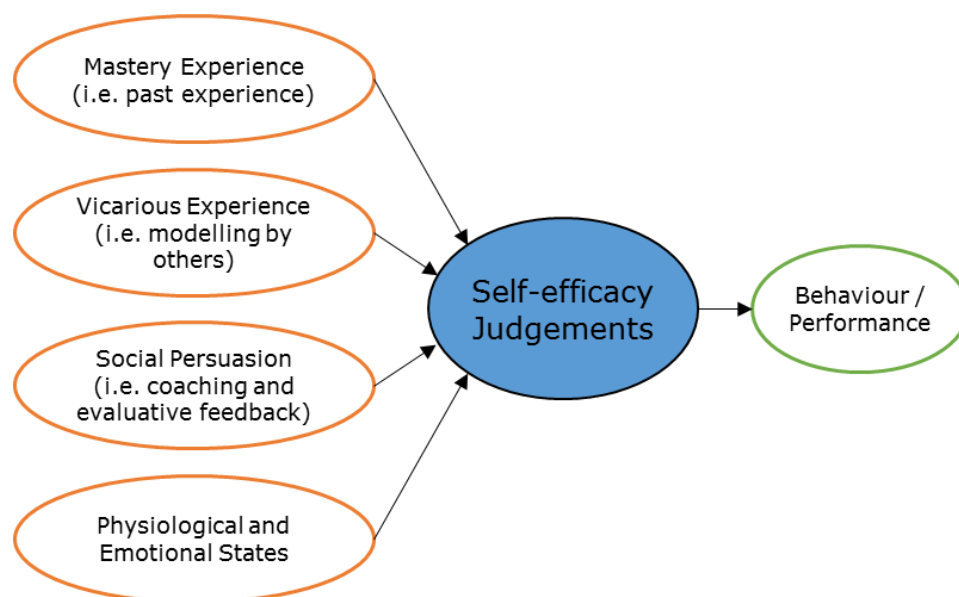


Fig 2.0 Sources of Self-efficacy building information

Source: adapted from Bandura in Driscoll, 2004

## Mastery experience

Mastery experience is the perception that one has been successful in performing a task and is the most powerful of the four builders. Bandura (1977) found that performance-based treatments not only promote behavioural accomplishments, but also extinguish fear around the task. This thinking was developed at the time he was working with phobics (Bandura, 1977), but has been applied to a variety of tasks thereafter. This source of efficacy building is especially powerful because it is based on personal mastery experiences. Successes increase perceived self-efficacy; repeated failures decrease it. Mastery was especially significant if failures occurred early in the course of events, did not entail a lack of effort or adverse external conditions (Bandura, 1982). After repeated successes, which build strong efficacy expectations, the negative impact of the odd failure is likely to be lowered (Bandura, 1977). To remedy weak self-efficacy the mastery task must also have a degree of difficulty. To succeed at easy tasks (low hanging fruit) provides no novel information for changing one's sense of self-efficacy, whereas mastery of challenging tasks conveys significant evidence of enhanced competency (Bandura, 1977). Moreover, the occasional failures that is later overcome by pure determination can actually strengthen self-motivated perseverance as an individual discovers that through experience even the most difficult obstacles can be conquered by sustained efforts (Bandura, 1977).

Bandura's (1977) experiments with mastery experience found that the subjects' performance change corresponded closely to the magnitude of expectancy change; the greater the increments in self-perceived efficacy, the greater the changes in behaviour. On the downside, when a successful experience contradicts long held expectations of self-efficacy, an individual may undergo little change if the conditions of performance lead to the discounting of the importance of the experience (Bandura, 1977). Expectations that have served self-protective functions for years are not swiftly discarded, notes Bandura (1977).

### Vicarious experience

Vicarious experience is the perception that another individual or group has been successful through the observation of their actions (Bandura, 1977). We develop much of our behaviour through a process of modelling others (Bandura, 1977). By observing others, we form a conception of how new behaviour patterns are performed, and later the symbolic construction serves as a guide for action (Bandura, 1977). Bandura's experiments showed that repeated observation of successful performances increased self-efficacy by a significant amount, which in turn was accompanied by similarly large increments in performance.

In Bandura's experiments with phobics, he observed that phobics seeing others perform threatening activities without adverse consequences could generate expectations that they would also improve their condition if they intensified and persisted in their efforts (Bandura, 1977). The individuals would persuade themselves that if others could do the 'scary task', then they should also be able succeed in the task (Bandura & Barab, 1971). In an organizational setting, peers taking brave choices to integrate sustainability, and showing success, would encourage similar behaviours in those previously reluctant to do so. In support of this idea, Kotter (1995) argues that there must be a conscious attempt to show people how the new approaches, behaviours, and attitudes have helped improve performance if one wants to institutionalize change in corporate culture. Observing the successful outcomes of sustainable behaviour constitutes a positive vicarious experience, and in theory would improve the self-efficacy of co-workers for the task of integrating sustainability behaviours.

### Social persuasion

Social persuasion is the perception of encouragement, and feedback or approval in response to a performance (Bandura, 1986). Bandura (1986) asserted that individuals could be persuaded to believe that they have the skills and capabilities to succeed.

Receiving verbal encouragement from others helps individuals overcome self-doubt and instead to focus on giving their best effort to the task at hand and is often used to influence human behaviour because of how easy and readily available it is (Bandura, 1986).

Bandura's (1977) research found that individuals who are verbally persuaded that they have the capacity to succeed in difficult situations, and who are provided with assistance for effective action, are likely to make greater effort than those who receive only the assistance. However, raising expectations of someone's competence without providing support to facilitate successful performance most likely leads to failures that discredit the persuaders, and further weakens the recipient's perceived self-efficacy (Bandura, 1977). Goddard et al. (2004) found that talks, workshops, professional development opportunities and feedback by credible 'models' concerning achievement can all inspire action in an organizational environment.

Another consideration is that the impact of verbal persuasion on self-efficacy may vary considerably depending on the perceived credibility of the persuaders, their prestige, trustworthiness, expertise, and conviction (Bandura, 1977). This means purposeful verbal persuasion should come from respected individuals in the organisation in order to maximise the impact on self-efficacy.

### Affective state

Affective state is an individual's degree of anxiety or excitement in response to their own perceived performance (Bandura, 1986). Individuals rely partially on their physical and emotional states in judging their self-efficacy (Bandura 2011). Thus moods, emotional states, physical reactions, and stress levels all impact how an individual feels about their personal abilities in a given situation (Bandura, 1986). Individuals may read visceral arousal in stressful and difficult situations as an ominous indicator of potential failure (Bandura, 1982).

Bandura (1977) is careful to explain that it is not the sheer intensity of emotional and physical reactions that is important, but instead how these feelings are perceived and interpreted. Self-referent doubts create stress and impair performance by diverting attention away from how best to tackle the task at hand to concerns over failing and potential errors (Bandura, 1982). By learning how to minimize stress and elevate mood when facing difficult or challenging tasks, individuals can improve their sense of self-efficacy (Bandura, 1977).

Furthermore self-efficacy can be strengthened by managing anxiety and depression, building physical strength and stamina, and correcting any misreading of physical and emotional states. Many health and relaxation initiatives, for example employee wellness programmes, at forward thinking organisations are drawing on this concept to promote a more productive workforce.

Although Bandura (1982) acknowledged the efficacy builders discussed above as key for the construction of efficacy, he also argued that it is an individual's cognitive appraisal and integration of these experiences that ultimately affect efficacy. This is the area of focus in the development of my model of antecedents. I next discuss the interpretation of past experiences of efficacy builders.

### **Interpretation of efficacy builders**

Prior work on self- and collective-efficacy would suggest that mastery, vicarious experiences, social persuasion and an individual's affective state may play a role in building an individual's SES and CES (Bandura, 1986). Yet, it has also been proposed that each of these experiences contains a variety of external and internal information cues that can influence an individual's judgement of self-efficacy (Gist & Mitchel, 1992). In their theorising on the determinants and malleability of self –efficacy they emphasize the need for:

*"...an examination of self and setting by which the individual assesses the availability of specific resources and constraints for performing the task at various levels. This assessment requires consideration of personal factors (e.g. skill level, anxiety, desire, available effort) as well as situational factors (e.g. competing demands, distractions) that impinge on future performance."*

In their model of the self-efficacy - performance relationship shown below, Gist and Mitchell (1992) depict three types of assimilation and integration processes an individual undertakes in assessing the experiences of the four efficacy builders. The first is task requirement, second the attributional analysis of past performances, and lastly an assessment of the resources and constraints arising from personal or situational conditions. This last aspect is the key focus area in developing a model of antecedents for SES and CES in Chapter 4, answering the question of what are the factors that impact an employees' judgement of SES or CES.

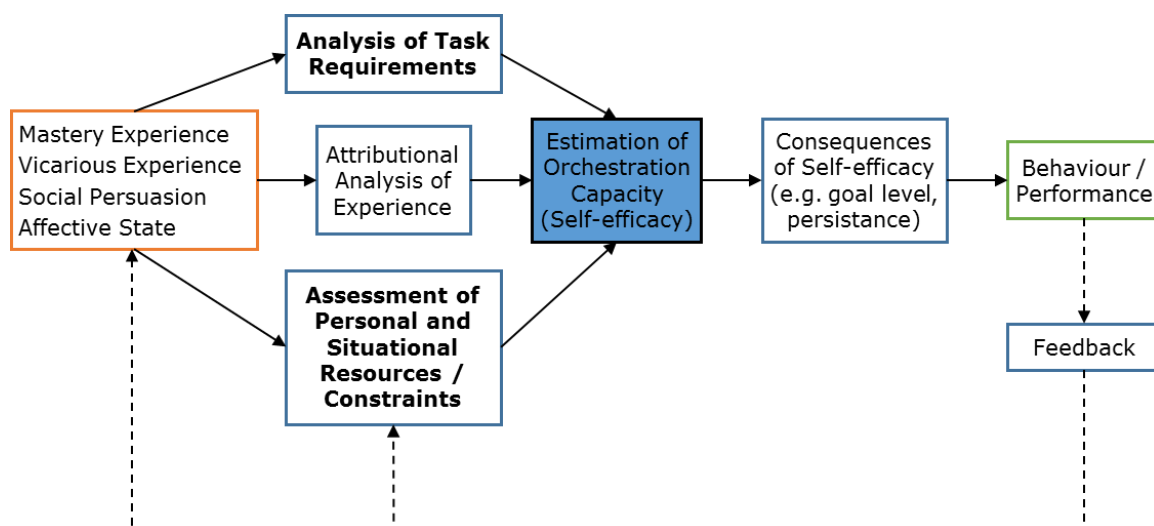


Fig 2.1 Model of Self-Efficacy-Performance relationship

Source: adapted from Gist & Mitchell, 1992

An assessment of task requirement concerns what skills and how much time might be needed to perform a specific task at a certain level of performance. When a task is a new

behaviour, task assessment is more in-depth (Gist & Mitchell, 1992). With attributional analysis an individual will assess why a certain past performance level was reached. They might put this down to their own skill (thus strengthening self-efficacy), luck or another reason such as complexity of the task. Gist and Mitchell refer to how these two antecedent processes do not provide all the information necessary for a full assessment of self-efficacy. They argue that an examination of the individual and environmental factors is necessary to assess the resources and constraints which may impact the future performance of the task. Examples of personal factors include: desire, available effort, and knowledge; and for environmental factors: workplace distractions, unsupportive managers, or appropriate tools provided.

A more detailed analysis ensues when a task is significant or important to the individual (Gist & Mitchell, 1992). For instance for those employees with sustainability as part of their formal roles, or who feel personally committed to a sustainable lifestyle, the task integration of sustainability at work will be more intensely assessed. In building their assessment of whether they are equipped to accomplish this successfully they will carefully consider the requirements of the task itself and resources or constraints that arise from their own personal situation and the supporting or limiting working environment.

Bandura (1982) and Gist and Mitchell (1992) proposed that when assessing self-efficacy cognitive appraisals of past experiences, tasks, personal and situational conditions and attributions take place. But, considering that self-efficacy is contingent on the task at hand, we do not have a clear understanding of what experiences and conditions are most salient in shaping these cognitive appraisals with regard to particular kinds of self-efficacy, such as self-efficacy for sustainability. In addition, the efficacy literature has considered these antecedents with regard to self-efficacy, but not collective efficacy, which I discuss in more detail below. Gully *et al.* (2002) note that individuals assessing collective efficacy are likely to make similar judgements, including judgements about the beliefs, motivation, and

performance of their co-workers, but this requires further exploration. In this research, I refer to the set of assessments of personal/group, situational and task requirements as efficacy judgement factors and aim to develop a model of these judgement factors for both self- and collective efficacy for sustainability.

Self-efficacy theory has not been without its critics. Marzillier and Eastman (1984) propose there is a fundamental ambiguity in Bandura's (1977) definition of self-efficacy, which originates out of his attempt to define self-efficacy expectations independently of outcome expectations. (See a description of Outcomes Expectancy Theory in Section 2.3.4) Marzillier and Eastman (1984) do not argue that outcome expectations override self-efficacy, but rather that *both* are important for behaviour change. Furthermore, and strong opposition to Bandura, they posit that it is impossible to exclude considerations of outcome from any assessment of personal self-efficacy. The issue deepened as, although Bandura's studies focused on discrete tasks, the applications for self-efficacy moved beyond discrete tasks with limited outcomes. Research has demonstrated that expected outcomes causally influence self-efficacy judgments - some authors have argued that this invalidates self-efficacy theory (Williams, 2010)

The methodology used by Bandura and his colleagues in assessing self-efficacy expectations has also been challenged. Marzillier and Eastman (1984) are joined by Kirsch and Wickless (1983) and Kirsch (1980) in contending that the strength of the relationship between self-efficacy and their empirical findings is overblown by the use of the hierarchical rating scale.

Another critique comes from the epiphenomenalists and behaviour analysts who applying control theory (Powers, 1991) contend that perceived self-efficacy is simply a reflection of past performances (Biglan, 1987). However, this has been countered by a meta-analysis demonstrating that perceived self-efficacy contributes independently to subsequent performance after controlling for prior performance and indices of ability (Bandura &

Locke, 2003). Despite these critiques self-efficacy is acknowledged as '*a seminal addition to social learning theory and has had tremendous influence on psychological theory and research*' (Williams, 2010).

### **2.2.2 Collective efficacy**

In contrast to self-efficacy, which is focussed on the individual, collective efficacy is the shared belief among members of a group that they are equipped to cope effectively and efficiently with the demands, challenges, stressors, and opportunities they face (Bohn, 2010). Many of the challenges and difficulties individuals face reflect group problems requiring sustained collective effort to produce any significant change (Bandura, 1986). Indeed, Maddux (2000) goes as far as to say:

*'In a world in which communication across the globe often is faster than communication across the street, and in which cooperation and collaboration in commerce and government is becoming increasingly common and increasingly crucial, understanding collective efficacy will become increasingly important.'*

The challenge of collaborative activities is to combine diverse self-interests to service common goals and intentions (Bandura, 2001). The strength of groups, organisations, and even nations, lies partly in individuals' sense of collective efficacy that they can solve their problems and improve their lives through determined effort (Bandura, 1986). Collective efficacy will influence what people choose to do as a group, how much effort they put into it, and their staying power when group efforts fail to produce results (Bandura, 1986).

Collective efficacy research has focused largely on fields such as education and medicine, but there was a noticeable parallel of findings in other fields such as business, management and sociology (Goddard et al., 2004). Prior research has demonstrated that collective efficacy beliefs are strongly related to other important group outcomes, such as work group effectiveness and neighbourhood safety. Collective efficacy plays out in the

organisational context where for instance employees judge the efficacy of their organisational group. Bandura (2006) opines that employees would most certainly assess how well key colleagues execute their roles. Moreover he notes that the belief of collective efficacy affects the sense of mission and purpose of a system, the strength of common commitment to what it seeks to achieve, how well its members cooperate to produce results, and the group's resiliency during difficulties (Bandura, 1997, p469). These outcomes translate well to an organisational context where companies espouse a strong mission (or vision), seek collaboration from and resilience in the face of challenges from its employees.

The link between self- and collective efficacy is significant. A group's beliefs that they can effect change by working together is largely grounded in the perceived self-efficacy of each of its members (Bandura, 1986). It is virtually impossible to create a strong collective group from individuals who suffer from a deep sense of self-doubt (Bandura, 1986). Individuals with low self- efficacy see little incentive in trying to exercise control, or if they try they easily convince themselves of the pointlessness of further effort when they encounter difficult obstacles (Bandura, 1997). The fact that self and collective efficacy are thus linked in group endeavours, motivated the two part SES and CES scales in this research.

Historically collective efficacy has been measured in one of two ways: either as an average of the self-efficacy scores of individuals, or as an average of the collective efficacy scores of individuals (Goddard et al., 2004). The latter holistic appraisal incorporates the coordinative and interactive aspects operating within groups, therefore is a more conceptually coherent approach (Bandura, 2000). It is also the most commonly used approach to measuring collective efficacy. Thus, I applied the approach of aggregating employees' appraisals of their group's capability operating as a whole (Bandura, 2000) in my research.

## **Task Interdependence**

On a basic level, task interdependence is the extent to which activities are dependent on each other. Task interdependence influences the emergence of collective-efficacy versus self-efficacy as a team-level construct. The greater the interdependence of the task, the greater the requirement for collaboration and cooperative behaviour in the group to complete the task (Wageman & Gordon, 2005).

There are three categories of task interdependence. The first is sequential interdependence: when one task is completed then handed on for the next stage. An assembly line is an example of this, with each stage clearly defined in the process, thus, there is little dependency between each stage (Van de Ven, Delbeq, & Koenig Jr, 1976). The second is pooled interdependence: when inter-dependent task are undertaken simultaneously and the final result of each activity is put together (or 'pooled'). Such dependency is the easiest of the three to manage because each group works on the activity independently, and thereafter unite for the final stage where all items are put together. The third is reciprocal interdependence: when task are conducted with repeated interaction between each other; this type of activity requires sustained interaction between individuals for the task to be completed and is the most difficult to manage. An example of this is a marketing department in a company which has to continually communicate current demand trends to the company to keep them well informed about what should be created. Simultaneously the operations of the company has to continually communicate with the marketing department to provide information on what products should be marketed to which target group (Van de Ven et al., 1976).

Can we consider embedding sustainability in the workplace as an interdependent task? If so, it would therefore be appropriate to apply a test of collective efficacy for sustainability. Different sustainability integration tasks may be to a greater or lesser extent interdependent. At the least, achieving a 'sustainable organisation' would require pooled

interdependence - each person integrating sustainability into their own role to make up the whole organisation. However in this situation, the element of emergence would most likely be absent. Considering sustainability as a systemic concept - where continual emergence and feedback loops require ongoing communication and adjustment - reciprocal interdependence appears as an appropriate fit. For example green product development, where feedback passes from customers to product developers, to marketers, to customers, and to strategy, and continually informs the product's development shows a system of reciprocal interdependence. 'Industrial symbiosis' and related concepts such as the circular economy encourage organisations to recover and reuse energy, water, and materials, mimicking natural ecosystems. The longest-lived industrial symbiosis is found in Kalundborg, Denmark, where exchanges of excess heat, steam, and material resources have occurred between organisations since the early 1970s, a good example of sequential interdependence (Parmigiani & Howard-Grenville, 2011).

Next I bring the efficacy theories and organisational sustainability integration together in a discussion on the development of the constructs of SES and CES.

### **2.2.3 Theorising the Constructs of Self- and Collective Efficacy for Sustainability**

In this section I discuss how my theorisation of the constructs of SES and CES was informed by a combination of concepts from the embedding organisational sustainability and efficacy theory. After reviewing the literature and analysing the possible meaning of the terms, I defined SES and CES as follows:

- Self-efficacy for Sustainability: an individual employee's judgment of his or her own capability to improve the sustainability performance of the organisation.

- **Collective Efficacy for Sustainability:** an individual employee's judgement of the collective capability of their working group<sup>4</sup> to improve its sustainability performance.

Sustainability concerns the natural, social, and economic aspects of life. Bandura (1982, 2006) has addressed the challenges of sustainability in his writings. He referred to rapidly changing conditions which worsen the quality of social life and degrade the natural environment, and which call for wide-reaching solutions and greater commitment to shared purposes. Time is of the essence as we struggle to maintain the health of planetary boundaries before they reach the tipping points of collapse (Whiteman, Walker, & Perego, 2012). Bandura proposed that the solutions rests with the mutual effort of people who have the skills, the sense of collective efficacy, and the incentives to shape the direction of their future environment (Bandura, 1982). Moreover, collaboration increases the speed of information flow and decision making, which lead to accelerated action (Busi & Bititci, 2006). Therefore the stronger efficacy for collaboration, the greater chance we have of attaining and maintaining the health of the natural world.

Social environments, such as those within organisations, may constrain or facilitate optimal behaviours. Whether employees' efforts are socially constrained or supported by others will depend partly on the strength of collective efficacy among the employees (Bandura, 1982). How this translates to sustainability integration is that even if management develop policies and procedures to achieve sustainability, if the workforce does not have strong collective efficacy for these tasks, management's efforts may not have the desired effect of embedding sustainability.

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<sup>4</sup> Working group can refer to business unit, department, or entire organisation depending on how broad the survey user wishes to extend the context. The survey user should assess the appropriate wording based on the how broadly they wish the respondent to consider their co-working group.

Efficacy theory is suited to the tasks required to embed sustainability within an organisation. Efficacy beliefs influence people to think erratically or strategically, optimistically or pessimistically (Bandura, 2006a). Facing global sustainability challenges benefits from having a strategic and optimistic mind-set (French, 1995). Influential thought leaders in sustainability refer not only to strategic and optimistic thinking, but also a sense of hope (Snyder, 2002b). General self-efficacy is a concept very similar to hope as it draws on the self-referential, cross-situational beliefs that the person will initiate and continue goal-directed actions (Snyder, 2002; Luszczynska et al., 2005).

In developing his scale for organisational efficacy Bohn (2010) hypothesized three theoretical factors:

1. Sense of collective capability: can we work together to accomplish the goal?
2. Sense of mission, future, or purpose: do we know where we're going?
3. Sense of resilience: can we stay the course in the presence of obstacles?

Influenced by Bohn's work and a combination of factors that commonly appear in the field of efficacy, (capability, resilience, and affective state), my assessment of possible factors included:

#### SES

1. Capacity - can I accomplish the sustainability integration tasks?
2. Understanding - can I understand how to change my and others work to integrate sustainability?
3. Resilience - can I bounce back from setbacks and continue to pursue sustainability goals?
4. Positive Outlook - can I manage my anxiety and / or excitement for the task of integrating sustainability?

## CES

1. Collaboration - can we work together to accomplish our sustainability goals?
2. Vision - do we know where we're going in terms of sustainability?
3. Resilience - can we stay the course for sustainability in the presence of obstacles?

In terms of standard scale validation techniques, exploratory and confirmatory factor analysis is required to ascertain whether these are indeed the likely factors of the constructs of SES and CES. This exercise and its (positive) results are discussed in more detail in Section 3.1.2.

I propose that self- and collective efficacy for sustainability can be built and strengthened by the basic foundations discussed earlier. For example, mastery experiences, (such as designing and completing a sustainability related project), vicarious experience (seeing how other departments or companies have managed to achieve success in sustainability), and social persuasion (being inspired by a company leader or credible external speakers on sustainability topics) all would be effective builders for efficacy for sustainability. Managing affective state is also critical for change agents as managing emotions and staying optimistic in the face of wicked problems is critical for successful performance.

Efficacy is also an appropriate construct to consider in efforts to embed sustainability as strong efficacy results in greater: 1) acceptance of increasingly difficult challenges, 2) ability to deal with novel situations, 3) resilience, 4) levels of interest, commitment and 5) effort given to a task (Bandura, 1982). These outcomes would be ideal to bring about sustainability change within organisations which are on a journey of making sustainability business-as-usual.

Developmental studies show that a strong sense of collective efficacy promotes a pro-social orientation characterised by cooperativeness, helpfulness, and sharing (Bandura, 2000), particularly useful characteristics for integrating sustainability – behaviours which

may not always be aligned with personal interests. Finally, integrating sustainability behaviours is not solely an individual employee endeavour, but also a group collaborative process. It takes coordination between teams, divisions and layers of hierarchy to bring about organisational pro-sustainability changes. I therefore consider the marrying of collective efficacy with sustainability integration behaviours to be appropriate.

### **2.3 A consideration of related constructs**

During my review of the literature, a number of related behavioural theory constructs came to light that could be useful in understanding the gap between intention and sustainability behaviours. I selected these theories for discussion here because, although they play a part in behavioural outcomes, they should not be confused with self- and collective efficacy theory. I briefly discuss each theory and explain why I chose to address self- or collective efficacy rather than: Organisational Efficacy, Locus of Control, Self Esteem, Social Exchange Theory, Outcome Expectancy Theory, the Theory of Planned Behaviour or Reinforcement Theory

#### **2.3.1 Organisational Efficacy**

As referenced in Section 2.2.3, an organisational efficacy scale was developed by James Bohn (2010). The objective was the measurement the collective employee perceptions of an organisation's ability to perform in the face of stress. According to Bohn (2010) organisational efficacy is a subcategory of collective efficacy, narrowed to specific business populations. The factors for organisational efficacy identified were firstly sense of collective capability, secondly sense of mission or future, and lastly sense of resilience. These factors influenced my hypothesized factors in the collective efficacy for sustainability scale being developed in this research. Although organisational efficacy was domain consistent, (also set in the organisational context), it was not task-specific for sustainability. It related more to the business-as-usual task outcomes of running a successful organisation, than to sustainability related work behaviours. So, although

Bohn's organisational efficacy concept helped greatly to influence the approach of the current research, I did not specifically apply the theory of organisational efficacy.

### **2.3.2 Locus of Control and Self Esteem**

Locus of control refers to the extent to which a person believes they can control events affecting them (Rotter, 1966), and is an established aspect of personality studies. This concept is an individual's fundamental appraisal of themselves and therefore a likely concept to apply when researching hindrances to behaviour (Judge, Locke, & Durham, 1997). It is one of the four dimensions of core self-evaluations; the other three are self-efficacy, self-esteem and non-neuroticism (Judge et al., 1997).

According to Rotter (1966) the locus is conceptualized as either *internal*, where the person believes they can control their life, or *external*, where they believe their decisions and life are controlled by environmental factors which they cannot influence, or by chance or fate. Self-efficacy differs from locus of control in that it relates to competence in circumscribed situations and activities, rather than more general quasi-situational beliefs about control. For example, although individuals may have a high internal health locus of control and thus feel in control of their own health, they may not feel efficacious in executing a specific treatment routine that is essential to maintaining their own health (Roddenberry & Renk, 2010).

This research is concerned with everyday work behaviours, which I assume employees will have at least some control over, and therefore locus of control is not as suitable a concept to apply as efficacy. There is no denying that locus of control does indeed have an influencing effect on motivation. In situations where management may not be orientated towards embedding a culture of sustainability, employee locus of control may become a more significant issue. However, this situational context is beyond the scope of my intended research.

Another core aspect of self-evaluation is self-esteem, considered to be a feature reflecting an individual's characteristic, affective evaluation of the self (e.g., feelings of self-worth or self-liking). Self-esteem is a generic assessment of self and therefore differs from self-efficacy which is a judgment about task capability, that is not inherently evaluative (Gist & Mitchell, 1992), and always refers to task specific capability (Brockner, 1988). According to Brockner (1988, p14) self-esteem typically refers to a macro construct that taps individuals' self-evaluations, and not only their confidence judgments across a wide variety of situations. Bandura (2006, 2011) explained the difference between self-efficacy and self-esteem by using examples where low self-efficacy (for example, in ballroom dancing) is unlikely to result in low self-esteem because competence in *that* domain may not be very important to that individual. The aim of this research is not to assess broad evaluations of employees' esteem, but to establish a propensity to act out specific tasks, and therefore self-esteem has not been chosen as a specific theory to test in this research. That is not to say that self-esteem is not an important factor in workplace performance<sup>5</sup>, but that it is also considered beyond the scope of this particular study.

Lastly, neuroticism refers to a long-term tendency to be in a negative emotional state and considered by some as the negative aspect of self-esteem (Judge et al., 1997). I did not consider it a salient topic to include in this research as it represents a global evaluation individuals make about themselves or their relationship to their environment (Judge et al., 1997), rather than a contextual and task-specific judgement of capability with strong predictive capacity.

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<sup>5</sup> Those with low self-esteem often perform more poorly than do those with high self-esteem (Korman, 1970; Shrauger, 1972). It stands to reason that an underperforming employee is unlikely to exhibit the tenacity and creative thinking required to enact sustainability embedding activities in their role.

### **2.3.3 Organisational Citizenship Behaviour for the Environment**

Social exchange theory (SET) has recently emerged as a relevant framework for studying pro-environmental behaviours (PEBs) in the workplace (Paillé & Boiral, 2013). SET addresses the study of the main effects of reciprocity on long-term relationships among stakeholders within an organisation (Olivier Boiral, Talbot, & Paillé, 2013). I was interested in theories that address sustainability-related action in the workplace, hence considered SET as a theory apply.

One form of PEB is the construct of Organisational Citizenship Behaviour (OCB), which is also explained theoretically by SET. Attributed to Dennis Organ (1988, p4), OCB is defined as 'individual behaviour that is discretionary, not directly or explicitly recognised by the formal reward system, and that in the aggregate promotes the effective functioning of the organisation'. There are three aspects in this definition that are pivotal to this construct. Firstly, OCBs are believed to be discretionary behaviours, which are not part of a job description, and are therefore performed by the employee as a result of personal choice. Secondly, OCBs go above and beyond that which is an enforceable requirement of the job description. Finally, OCBs contribute positively to overall organisational effectiveness (Organ, 1988, p.4). OCB was then extended to Organisational Citizenship Behaviours for the Environment (OCBEs). OCBEs are individual and discretionary behaviours performed by employees, that are not explicitly recognised by the formal reward system, whereby they demonstrate their willingness to cooperate with their organisation and its members by performing behaviours in the workplace *that benefit the natural environment* (Boiral 2009, p. 223; Paillé & Boiral, 2013).

Although OCBE would appear to be a suitable theory in this research which seeks to propose levers for embedding sustainability, (which naturally encompasses pro-environmental behaviours in the workplace), it falls short in a number of areas:

1. Although extraordinary voluntary behaviours for the environment are highly desirable, these are not the desired research subject, which is the possible antecedents of embedding sustainability into every day behaviours. Researching OCBEs would exclude regulated or (tacitly) expected sustainability tasks that are at the core of this research.
2. OCBEs are focussed on environmental factors, whereas sustainability also encompasses social equity, economics and governance factors. Prior research concerning workplace sustainability emphasizes environmental sustainability (Andersson, Shivarajan, & Blau, 2005; Ramus & Steger, 2000), often to the exclusion of social sustainability (Barkemeyer, Holt, Preuss, & Tsang, 2014).
3. OCBEs do not seem to cater for collective or collaborative action as collective efficacy does; it appears to be focussed on the individual (described as 'individual, voluntary and informal initiatives' by Boiral et al. (2013)). Voluntary work is not necessarily a collective exercise.
4. OCBEs are not necessarily linked to an organisation's core business. For instance one of the examples used was the donating of books. This does not transform an organisation into a 'sustainable company'. The strategic transformation of core activities is considered more important than voluntary add on, non-core activities. My research focuses on broader, higher level behaviours for sustainability integration, rather than CSI type activities.
5. Lastly a concern is the regulated versus discretionary nature of today's organisational roles. Organ (1997) acknowledged criticism of his theory by conceding that since his original definition, roles have moved away from a clearly defined set of tasks and responsibilities, and instead have evolved into much more ambiguous roles. Without a defined role, it thus becomes difficult to operationally define what is discretionary or not.

In summary, I considered it preferable to focus on efficacy for broad sustainability action, which incorporates formalised or voluntary workplace actions, rather than the limited, voluntary-only organisational citizenship behaviours (OCBs), or organisational citizenship behaviours for the environment (OCBEs).

#### **2.3.4 Outcome Expectancy Theory**

Outcome Expectancy Theory (OET) proposes that an individual will decide to act in a certain way, because they are motivated to select one behaviour over other behaviours due to what they expect the result of that selected behaviour will be (Oliver, 1974). OET developed from a study of the motivations behind decision making, a theory based firmly in the field of management studies (Vroom, 1964). To differentiate the concepts under discussion, self-efficacy is a judgment of an individual's capability to accomplish a certain level of performance, whereas an outcome expectation is a judgment of the likely consequence such behaviour will produce (Bandura, 1986). Outcome expectancy is thus theoretically independent from self-efficacy (Henson, 2001), however efficacy theory and OET do interact in creating motivation for action, and thus warrants further discussion.

In situations where the outcomes from specific performances are not controlled by the actual performances, efficacy beliefs make up a smaller part of the variance in outcome expectations (Pajares, 1997). Pajares (1997) explains that in systems which may be prejudicially structured, outcomes can be highly independent of the performances in which individuals engage. For example, when individuals perceive that the preferred outcomes will not result from their efforts, no matter how hard they work, efficacy beliefs will not be predictive of outcomes (Pajares, 1997). The significance of this is that where, for example, organisational management has neglected to set up the appropriate formal and informal structures, policies or signals for embedding sustainability behaviour, employees' collective efficacy for sustainability may not be a reliable predictor of pro-sustainability behaviour.

Furthermore, in those circumstances where individuals have little experience with the behaviour they are contemplating, outcome expectancies may have a stronger direct influence on behaviour than self-efficacy. Schwarzer & Fuchs (2005) argue that only after a sufficient level of experience is attained does self-efficacy receive the majority share of the intention variance. This is an interesting consideration in this research, as there is the possibility employees may have had limited or no experience in embedding sustainability. Unfortunately, concurrent testing for outcome expectancies is beyond the scope of this research.

Schwarzer and Fuchs (2005) describe two phases leading up to the performance of a task: the first, a motivation phase where people choose what to do; the second, the volition phase where how hard they try and how long they persist are played out. The volition phase, (effort and persistence), is minimally influenced by outcome expectancies, and more strongly by self-efficacy as the number and quality of action plans are dependent on a person's perceived competence and experience (Schwarzer & Fuchs, 2005). Therefore, although OET does indeed influence an individual's decision to enact behaviours, it appears that SES has a stronger influence on embedding behaviour, and is more concerned with enacting behaviours, than with the decision-making process. Therefore I surmised that SES is the more applicable theory to apply in this research.

### **2.3.5 Theory of Planned Behaviour**

Icek Ajzen's (1991) Theory of Planned Behaviour (TPB) links beliefs and behaviour. The three factors of attitude towards behaviour, subjective norms and perceived behavioural control together shape an individual's behavioural intentions and actual behaviours. The

predictive power of the original theory of reasoned action<sup>6</sup> was improved upon by including the third factor of perceived behavioural control. It was established that due to circumstantial limitations, behavioural intention does not always lead to actual behaviour (Ajzen, 1991) and hence the third factor was to explain the link between behavioural intentions and actual behaviour where an individual's control over the behaviour is incomplete. The notion of perceived behavioural control has many parallels to Bandura's self-efficacy.

TPB has been applied in the field of environmental psychology (Branzei, Ursacki-Bryant, T. J. Vertinsky, & Zhang, 2004; Cordano & Frieze, 2000; Flannery & May, 2000; Nigbur, Lyons, & Uzzell, 2010) as in general pro-environmental actions carry a positive normative belief. Although there may be a behavioural intention to practice such behaviours, perceived behavioural control can be hindered by constraints such as a belief that one's behaviour will not have any impact (Ajzen, 1991, 2001) For instance, an individual may intend to behave in an environmentally responsible way, but there is a lack of accessible recycling infrastructure to facilitate this, therefore their perceived behavioural control is low and constraints are high. In this situation, the behaviour may then not occur (Ajzen, 2001). Applying the theory of planned behaviour in these situations helps to explain inconsistencies between sustainable attitudes and unsustainable behaviour. Despite this useful application, I took the decision not to use the Theory of Planned Behaviour for the following reasons:

1. To apply TBP the survey would need to include items to test for attitude towards sustainable behaviour and respondents' version of subjective norms around

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<sup>6</sup> A theory developed in 1975 by Martin Fischbein and Icek Ajzen, which predicts that behavioural intent is created by the factors of our attitudes and our subjective norms.

sustainability behaviour, resulting in a longer and denser survey. Keeping the survey succinct reduces answering fatigue resulting in higher quality responses. This was vindicated by the specific request of Finco management to limit the length of the survey.

2. In implementation research, interventions are designed to change the behaviour of individuals (Francis et al., 2004). TPB requires that the target behaviour be carefully defined in terms of its target, action and time. For example, in a transport context the target is the commuter, the action is the trip, context is the type of trip and time is the length time taken to travel. The variety of employee roles which require sustainability integration means that there would be multiple actions, making it very difficult to specify them all. Embedding sustainability behaviour is specific to role and context, and should be an iterative, ongoing process. Therefore the multifaceted nature of the sustainability embedding activities do not fit easily into a specified action required by this theory. Time is also a difficult aspect to define in the sustainability embedding context. Defining a reasonable time frame, or the number of times an action for sustainability takes place, is difficult to identify and therefore problematic for the research.
3. The TPB model requires that the actual behaviour is subsequently tested against the planned behaviour (Francis et al., 2004). In terms of complexity and access, this testing was unfeasible within the boundaries of this research and limitations regarding the live environment testing with Finco.
4. TPB does not appear to cater for collective or collaborative action, as collective efficacy is able to do. Therefore it may not be as useful in the organisational context for acquiring a group assessment of propensity for embedding sustainability.

Although TBP as a theory appears to be a more comprehensive and all-encompassing than efficacy, TBP was not utilised as the main theory in this research due to the reasons listed above.

### **2.3.6 Reinforcement Theory**

Reinforcement theory proposes that you can change someone's behaviour by using reinforcement, punishment, and extinction (Skinner, 1953, p.59). Rewards are used to reinforce the behaviour you want and punishments are used to prevent the behaviour you do not want. However, Bandura (1996) notes that many individuals faced with a positive outcome from a certain behaviour *still* do not perform that behaviour due to self-doubt in their ability to succeed. The argument is therefore that self-efficacy can nullify the motivational aspects of reinforcement theory. This impacted my choice of applying efficacy, rather than reinforcement theory in this thesis.

### **2.4 Conclusion**

The literature on embedding organisational sustainability, efficacy and other related constructs underpins the design of the empirical research in this thesis. After broadly addressing organisational sustainability, I discussed the constructs of self- and collective efficacy in detail, and in particular how an individual's cognitive appraisal of efficacy builders is pivotal to the exploration of antecedents detailed in Chapter 4. I also addressed how I applied self- and collective efficacy to the task of embedding sustainability in order to develop the constructs of SES and CES. The literature review informed my decision to focus on efficacy theory, distinguishing it from a range of other contemporary motivational theories. These related theories do indeed play an important roles in effecting behaviour, however the strong predictive capacity of efficacy remains the main reason for its selection in this study.

### **CHAPTER 3: SCALE DEVELOPMENT AND VALIDATION**

This chapter opens with a description of the research paradigm and methodology then outlines the approach and findings in each of the five phases of the survey development and validation process.

From an ontological perspective I approached the research from a pragmatic perspective, with a social constructionist epistemology. The pragmatist philosophy contends that choosing between one position (epistemology, ontology, or axiology) and the other is somewhat unrealistic in practice; and it is argued that the most important determinant of which position to adopt is the research questions (Creswell & Plano Clark, 2011; Saunders et al., 2009). This is particularly relevant where the research question does not suggest clearly that either a positivist or interpretive philosophy should be adopted in an inquiry.

In this work, Chapter 4 concerns a model building rather than a theory testing exercise, as well as being interpretive of qualitative data; both of these usually being indicative of anti-positivist ontology, therefore this research cannot be purely regarded as positivist in its approach. However, neither it can neither be described as purely interpretivist due to methods used which indicate positivism such as the statistical methods used in Chapter 3.

Further to this, although many research methods and techniques have typically been linked to specific paradigms, it has been noted that the link is neither sacrosanct nor necessary (Howe, 1988, 1992). Following this thinking the (mixed methods) techniques used here do not require a particular ontology. Similarly Social Constructionism (the epistemological basis of efficacy theory does not preclude the use of statistically-based development of measurement tools, nor the interpretive method for model building. Indeed Bandura himself provides guidance on developing such scales (Bandura, 2006b), and behavioural models in this subject matter area.

I therefore adopt a pragmatist approach as the most rational approach to address this paradigmatic conundrum, and applied research approaches mixed in a way that I believed presented the best opportunity for answering my research questions.

The phenomena of study (SES and CES) are socially situated and therefore by inference socially constructed. However this does not render these constructs immeasurable or non-generalisable. Although thoughts cannot be publicly observed, they do have indicators that mark their existence, for instance people can tell you what they are thinking (Bandura, 1989).

I employed a combination of deductive and inductive approaches in different phases of the study (El-akremi, Gond, Swaen, De Roeck, & Igalens, 2015; Hinkin, 1995, 1998a; Trochim, 2000). For example, in the beginning I deductively examined the literature in order to create a set of items to test the constructs of SES and CES. This approach is considered more reliable for ensuring construct validity (Hinkin, 1998) as the domain of interest is more likely to be broadly captured through reviewing existing literature than inductively devising the domain of interest as a single researcher. Thereafter I adopted an inductive approach when discussing and refining the items with fellow researchers and organisational members (Hinkin, 1995).

I employed both quantitative and qualitative methods in this research (Trochim, 2000). I used qualitative methods to review the literature, understand the domains of interest, make judgments for defining self- and collective efficacy for sustainability, and in developing the wording of scale items. Thereafter I applied quantitative processes to the numerical data collected from each survey run and quantitative statistical for testing for scale reliability and validity.

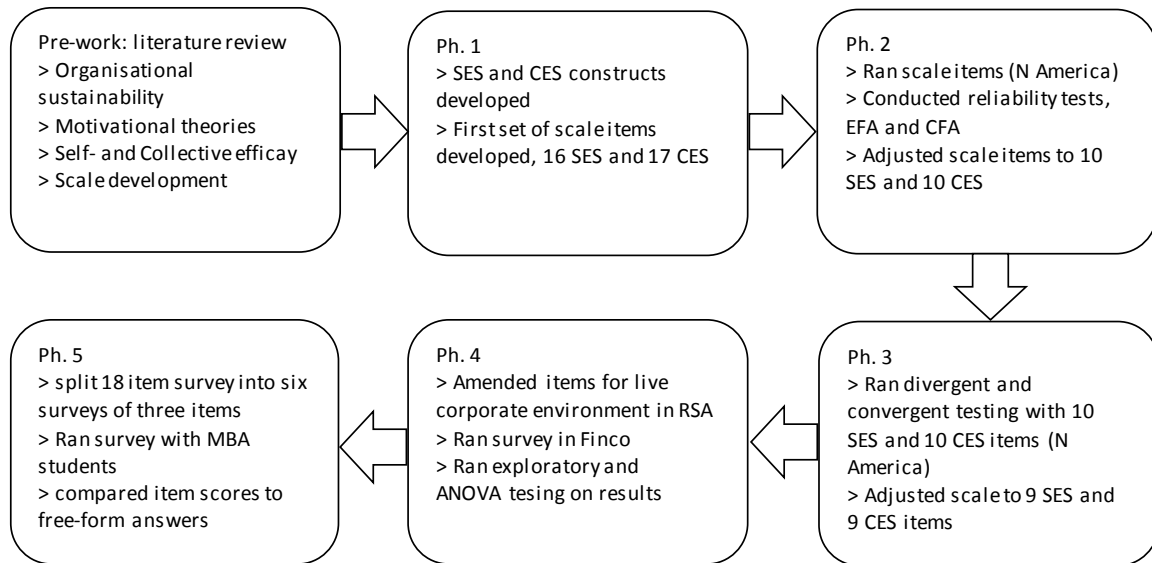


Fig 3.0 Process Flow Diagram of Scale Development

My process is illustrated in Fig 3.0 above. I started the research process by conducting a comprehensive literature review focusing on embedding organisational sustainability and self- and collective efficacy. I reviewed literature pertaining to scale development to inform the research process and quality of the survey development. The decision to use a scale to measure efficacy was supported by various articles on existing efficacy surveys. I detail the intricacies of efficacy scale development below. In Phase 1 I developed the constructs of self- and collective efficacy for sustainability, and derived the first set of items to test these constructs. I also drew on my personal experience as a sustainability manager within an organisation to develop the items.

In Phase 2, I tested the preliminary set of 16 SES and 17 CES items with a North American-sourced set of respondents, resulting in 292 and 281 usable responses respectively. I ran exploratory and confirmatory factor analysis on the data, as well as other statistical tests of scale internal consistency and reliability. In Phase 3, I ran reduced item scales of ten SES and ten CES items with specially selected alternative scales to test for convergent and divergent reliability. Usable responses numbered 150 and 135 respectively.

In Phase 4, I ran the amended 18-item survey in a live corporate environment. Before doing so I reviewed and amended the survey and items in collaboration with members of the organisation's sustainability, business marketing intelligence and strategy teams. Following Bansal and Roth's (2000) example, the selection of these informants was based on their knowledge of the ecologically-focussed initiatives of their organisation. Moreover, I spent three weeks as an intern with Finco to gain a better understanding of the sustainability culture and initiatives. During Phase 4 I also assessed the internal consistency, reliability of the scales, strength of SES and CES in the sample population. Finally, I used exploratory analysis and ANOVA testing to explore the relationships between the SES and CES results and demographic indicators.

In Phase 5, I split the 18 item survey into six surveys of three items each and trialled them with MBA students to further establish face validity. This phase was different in that I asked respondents to note why they had selected a specific score for each of the three items in their survey. Based on my qualitative analysis of the answers in relation to scale scores, I modified the items. I took the validity testing further by analysing and grouping the 242 free-form answers into High Agreement, Low Agreement or Neutral Response, and then compared them to their respective scores to see if what respondents were saying supported their choice of scores.

### **3.1 Scale Development and Validation**

I begin by discussing how I approached each phase, the key findings and the modifications resulting from each phase of the scale development and validation process. Where relevant, I describe the general principles of scale design and testing that informed my approach to scale development and validation.

### **3.1.1 Phase 1: Construct Development and Item Generation**

Phase 1 details how I developed the constructs of SES and CES, and the first set of items to test for the presence of these constructs.

#### **Construct development**

The first step in the process was to establish the constructs of Self-efficacy for Sustainability (SES) and Collective Efficacy for Sustainability (CES).

The general benefits of self- and collective efficacy have been explained extensively in the literature review, but they are particularly relevant to a world of rapidly changing negative social and environmental conditions. To resolve these difficult challenges, we need greater commitment to shared purpose, a characteristic key to collective efficacy (Bandura, 1982). Collective efficacy is a particularly important trait for an organisation concerned with ecological and social issues to have, as achieving sustainability is a highly interdependent phenomenon (WCED, 1987). Social environments, like organisational workplaces, may limit what employees do, or assist them to behave optimally. Whether employees' efforts are socially impeded or supported by others will partly depend on the collective efficacy of the employees (Bandura, 1982). This means that if a workforce does not have strong efficacy around management's policies and procedures to achieve sustainability, these efforts are unlikely to have the desired effect of embedding sustainability. Moreover the influential role of self-efficacy in human adaptation and change is confirmed in a number of meta-analyses of findings in different domains of functioning (Holden, 1991; Holden, S., Schinke, & Barker, 1990; Multon, Brown, & Lent, 1991; Stajkovic & Luthans, 1998; Fernández-Ballesteros, Díez-Nicolás, Caprara, Barbaranelli, & Bandura, 2002).

Taking these broader societal challenges into account, and contemplating the literature and possible meaning of the terms, I define the concepts of SES and CES as follows:

- Self-efficacy for Sustainability (SES): an individual employee's judgment of his or her own capability to improve the sustainability performance of the organisation.
- Collective Efficacy for Sustainability (CES): an *individual* employee's judgement of the collective capability of the organisation to improve its sustainability performance.

The emphasis on 'individual' in the CES definition above is to bring to attention that perceptions of CES are generated by the individual, and not the collective.

### **Self- and Collective Efficacy Scale Development**

To measure self- and collective efficacy for sustainability I chose to use a set of scales as this format is widely used as an effective measurement tool. A review of the literature in the field of self- and collective efficacy showed a large number of researchers utilising this method (Bandura, 2006; Bohn, 2010; Higgins & Compeau, 1995 ; Chen, Gully, & Eden, 2001; Spreitzer, 1995). Moreover Bandura (2006) provided significant guidance on how to develop valid self-efficacy scales. These techniques shall now be examined and discussed in light of this research.

An adequate self- and collective efficacy analysis requires a detailed assessment of the level, strength, and generality of perceived self-efficacy (Bandura, 1982). In addition, self-efficacy assessments should be linked to the behavioural factors over which individuals can exercise some control (Bandura, 2006). In this research I identify this as employee's everyday work. Multifaceted efficacy scales have predictive utility and provide insights into the dynamics of self-management of behaviour (Bandura, 2006). This means a number of aspects of sustainability behaviour can be tested together. Applied to my research, the SES and CES survey items queried a number of sustainability embedding behaviours, such as ability to influence others, perseverance in related projects, knowledge building and so on.

The construction of sound self-efficacy scales should be based on a good conceptual analysis of the relevant domain of functioning, or more simply the context (Bandura, 2006). In this research the domain of functioning encompassed the organisational setting and activity domain the relevant tasks for embedding sustainability practice into an individual's work. A self-efficacy score comes from all of the items encompassing the domain of activities, not for a specific item within it (Bandura, 2011). Survey items linked to activity domains situational contexts, and social aspects reveal the patterning and degree of generality of individuals' self and collective efficacy beliefs (Bandura, 2006). I thus developed the SES and CES survey items to refer to the activities (sustainability integration), the situation and the social context (the organisation) when surveying employees SES and CES.

Bandura (2006) warns there is no all-purpose measure of perceived self-efficacy. He explains that the 'one measure fits all' approach is limited in terms of its explanatory and predictive value as most of the items in an all-purpose test may not have much relevance to the domain of functioning. These general tests are disconnected from the situational demands and circumstances (Bandura, 2006). I addressed this potential pitfall by firstly identifying appropriate items during the informal interview process with the management of my target research company, and secondly by using language understandable and identifiable by the employee population as advised by management, or as used in company sustainability reports.

I now address task specificity as there is some controversy over the generalisability versus specificity of items in self- and collective efficacy scales (Bandura, 2011). There has been much criticism of what are referred to as 'omnibus' tests. General questions have been found to be less predictive of behaviour, obscure what is being tested, and decontextualize the self-efficacy -performance connection, but do have wider practical relevance. On the

other hand, efficacy task-specific questions were found to be more predictive of behaviour, but have less external validity and less practical relevance (Pajares, 1997).

Self-efficacy is usually viewed as being task-specific and/or domain-specific (Luszczynska et al., 2005). Bearing this in mind, my research focussed on task specific self-efficacy, but at a generalised level of embedding sustainability. For example, I did not include highly specific behaviours such as: ["I am confident I can recycle at work"](#), but pitched the queried behaviours at a more generalised level, for example: ["I am confident I can explain how sustainability relates to my work."](#) Item generation is discussed in more detail next.

### **Item Generation**

Items should initially be generated through a review of past literature and previously published and validated survey items (Torabi & Jeng, 2001). I followed a number of different paths to ensure I was able to review a significant body of relevant literature. First, I identified the keys terms from my research questions, such as self and collective efficacy, organizational sustainability, employee behaviour change, which allowed for a targeted approach. I then reviewed the contents lists of journals relevant to this sphere of work such as those in the Academy of Management stable, the Journal of Business Ethics and various psychological journals, such as the Journal of Applied Psychology. Using these terms, I searched internet databases Google and Google Scholar, and followed suggested 'related searches'. On reading relevant articles or books, I followed referenced references, thus switching to a citational approach which allowed me to source from different disciplines. I identified significant researchers in the field of study through key term searches and in-text references and followed these through to additional studies they had authored. To search for existing instruments, I used the words 'survey' and 'scale' in combination with other key words mentioned above. References to other surveys in survey-related articles also provided new sources. These searches took me into different contexts from the workplace: from education, through to medical research and nursing.

Throughout the study, I also accessed the recommendations of my supervisors of particular articles or authors.

I obtained background information on embedding sustainability into workplace culture and on self- and collective efficacy. Thereafter, I identified existing instruments that measure constructs such as efficacy for the purposes of informing the items and quality of the new scales (see: Bohn, 2010, Bandura, 2006; Effeney & Davis, 2013; Jones, 1986; Marakas, Yi, & Johnson, 1998; Norton, Zacher, & Ashkanasy, 2014; Shwarzer & Jerusalem, 1995; Spreitzer, 1995; Weber, Weber, Sleeper, & Schneider, 2004; Paillé & Boiral, 2013; Kiggundu, 1983; Wageman & Gordon, 2005; Fox, Spector, Goh, Bruursema, & Kessler, 2009). I also examined surveys with particular references to sustainability behaviours, such as SCALA: The Sustainability Culture and Leadership Assessment (Miller Consultants, 2013) and Boiral and Paille's (2013) OCBE scales.

By using and modifying these scale items for my context I was able to generate an initial pool of SES and CES scale items. See a list of initial items on Appendix N. In situations where I could not identify pre-existing items as a starting point, I developed them, drawing upon early interviews with practitioners and seeking input from academic colleagues on the wording of the items. A list of changes made on their suggestions is included at the end of Appendix N. I considered the relative importance of multiple items and, by grading, selected which items I considered to be more significant. The grading of items was indicated by a 1, 2 or 3, in order of importance. This was simple process of selecting which items my supervisor and I felt were more significant based on our working and academic knowledge of the field of organizational sustainability. We did this to reduce the number of items which had originally been considered.

The items were distinguishable both by domain and by level of agreeability. Domain can refer to both function and context. In this case the domain of *interest* is self- and collective efficacy for sustainability, and the domain of *context* is the working environment. When

creating surveys, it is important to define the domain of functioning, i.e. the context in which it would be applied. (Bandura, 2006). In this case, the SES and CES scales explicitly refer to 'the workplace' domain in the instructions, and often either explicitly or tacitly in the items themselves. For example one item states: "I am confident that I can make changes to the way that I **work** which will support **my organisation's** sustainability goals." I acknowledge that relevant experiences outside of the workplace may also play a role in building efficacy for sustainability, however investigation of experiences outside of the workplace was beyond the scope of this study.

All items were tested for content validity which is the extent to which a specific set of items reflects a content domain (DeVellis, 2003). It is more challenging to determine the exact range of potential items that represent an attributional<sup>7</sup> characteristic, (such as efficacy), than in a content domain with a clearly recognisable population of items, for example, reading ability (DeVellis, 2003). To address this challenge, a researcher can call upon recognised subject matter experts to evaluate whether the items adequately assess the defined content. I obtained such feedback from a number of people experienced in the field of sustainability who reviewed and commented positively on their perceptions of the content validity, and made comment on language and survey flow. These included: a leading researcher involved in both theoretical and practitioner work in embedding sustainability in the corporate sector, two post-doctoral colleagues (in statistics, organisational socio-ecological responses respectively), and three PhD students (two in organisational socio-ecological responses and one working in embedding sustainability throughout global organisations). I also showed the items to a group of lay persons in a

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<sup>7</sup>In social psychology, attribution is the process by which individuals explain the causes of behaviour and events.

social setting to assess if the items made sense at first glance; a concept formally referred to as face validity.

With limited available number of items to include in a survey, I did not want to waste any opportunity for genuine data collection. To ensure that every item could be genuinely answered by the respondents I developed items that were relevant and relatable for the experiences of the majority of employees. For example, not all employees control budgets, therefore I excluded an initially proposed item like: ["I am confident I can include sustainability-related project expenses in my annual budgets."](#)

Task specificity must be carefully considered when testing self- and collective efficacy. I was careful to develop items that would be specific enough to truly assess the self and collective efficacy for sustainability of the employees in an organisation, while still preserving a level of generalization so that the scales could be used in different organisations and for various industries. Bandura (2011) explained that there is a common misconception that self-efficacy theory is confined to 'narrow' task measures in which individuals judge their efficacy for a specific performance on a specific task. Judgments of self-efficacy for pursuits such as academic achievement, organisational productivity, entrepreneurship, and effecting social change encompass a broad scope of tasks, not just an isolated piece of work (Bandura, 2011). Additionally, Pajares (1997) advised that efficacy researchers should use their discretion to assess the appropriate specificity of tasks to be tested. Thus during the item development process I deliberated heavily on task specificity versus generalisability, as described in the next paragraph.

The items in the efficacy scales are not general, but nor are they narrowly specific. For example, they were not set at the detailed level of an individual action such as: ["I believe I am capable of recycling properly at work"](#). This would have presented a respondent with a very narrow and imposed view of sustainability integration behaviours, and therefore not have had wider practical relevance. Rather, the items were related to a broader

concept of sustainability integration behaviours such as, “I am confident I can explain how sustainability relates to my own work”. Thus my constructs of SES and CES do not highlight specific sustainability tasks; instead they are purposely vague. As such, these constructs are intended to describe general feelings toward the ability to integrate sustainability into everyday work behaviours and is therefore generalisable across a number of sustainability *functional areas*.

When developing items I queried what terminology respondents might know and understand. For instance, should I assume that they would (or should?) know their company’s sustainability strategies or goals? I decided that respondents should answer with their existing knowledge of sustainability and company strategies. However to provide some context to the survey, I did include an opening paragraph describing organisational sustainability. I also added a further instruction for participants not to do further research on the organisation’s sustainability policies or performance prior to answering the survey. The survey was top anchored, that is fixed on the high end of understanding and knowledge. A company with a very high score would be an exemplar of truly integrated sustainability culture.

Lastly, many of the items are prefixed by the phrase, “I am confident that...”, since efficacy scales intend to measure the confidence toward the probability, feasibility, or likelihood of executing a given behaviour. This phrasing reiterates that efficacy is a perception, not an activity.

## **Demographics**

The surveys conducted in Phases 2, 3, 4 and 5 each included a demographics section. The reasons for including demographics were (1) to assess how representative the sample was of the intended real population (i.e. employees in organisations), and (2) to assess whether SES and/or CES was more prevalent among certain groups. Demographic options

were adjusted where necessary for each round of validation, for example, different countries have different race classifications. In many instances, respondents were given the option not to disclose their demographic details (Gender, Race), or provided a text box to add details where an applicable answer may not have been listed (Race).

### **Preliminary Items**

The preliminary set of 16 SES and 17 CES items developed from the work outlined above in Phase 1 are presented in the Table 3.1 below. (I applied the US spelling of some words in the survey items as Phase 1-3 respondents were North America based).

Table 3.1 Preliminary set of SES and CES items

SES SCALE ITEMS
1. I am confident I can take the time to reflect on how my work needs to be adjusted to reduce my organization's negative environmental and social impacts.
2. I am confident that I can complete my work in a way that is in alignment with my organization's sustainability goals.
3. I am confident in making suggestions to my colleagues about ways to be more sustainable.
4. I am confident in my ability to make changes to my work that deliver on my organization's sustainability commitments.
5. At work, it is easy for me to stay positive about achieving our sustainability goals and aims.
6. I am confident that I can play a role in helping this company to become more sustainable.
7. I am confident in my ability to make changes in my daily tasks in order to work more sustainably.
8. In my work, I am confident that I can incorporate environmental, social and governance factors into my decision making.
9. I am confident in my ability to explain to my colleagues how sustainability relates to my work.
10. Even in the face of challenges, I am confident that I can undertake my work in a way that aligns with our organization's sustainability goals.

SES SCALE ITEMS
11. Even when there is limited support for the changes I am trying to make to improve the sustainability performance of our organization, I still persevere.
12. I am confident in my ability to alter the work that I do in a way that improves the sustainability performance of this organization.
13. The challenges to improving the sustainability of the work that I do are so great that I am unmotivated to pursue change (R)
14. I am excited to try out new ways of working that will contribute to delivering on our organization's sustainability strategy
15. There's no point in me trying to improve the sustainability of the work that I do since it won't make a difference overall in our organization (R)
16. I am actively looking for opportunities to improve my organization's sustainability performance.

CES SCALE ITEMS
1. People in this organization can tackle our sustainability challenges.
2. This company has a strong vision for sustainability.
3. People in this organization are unsure of how they can contribute to our pursuit of sustainability (R)
4. When this organization takes on a sustainability goal we are confident of achieving it.
5. People across this organization have a clear idea of where we are headed with regard to sustainability.
6. As an organization, we are very certain about what we will accomplish together in the area of sustainability.
7. People across our organization have a strong commitment to make our organization more sustainable.
8. As an organization, we are unlikely to achieve many of our environmental and social goals. (R)
9. As an organization, we pursue our sustainability goals, even when times are tough.
10. This organization is confident about its future path to sustainability.
11. When resources are scarce, sustainability would be less of a priority for this organization. (R)

CES SCALE ITEMS
12. People across our organization would try to improve our environmental and social impacts even in times of cost constraint.
13. People in this organization are able to mobilize to meet difficult and complex sustainability goals.
14. By working together, this organization can be a leader in environmental and social performance in its industry.
15. Our ability to work together makes me optimistic that we can improve our environmental and social efforts in this organization.
16. In this organization, everyone can work together effectively to meet our sustainability goals.
17. People in this organization are able to work together to reduce our environmental footprint and make a positive impact on communities.

### **3.1.2 Phase 2: Preliminary item testing**

Phase 2 details the trialling of the preliminary set of 16 SES and 17 CES items (as per Table 3.1) to assess the two scales' construct validity, internal consistency and reliability. Construct validity is explained as 'the degree to which a test measures what it claims, or purports, to be measuring' (Cronbach & Meehl, 1955). Internal consistency reliability concerns the homogeneity of the items within a scale with the scale items intended to measure a single phenomenon (DeVellis, 2003). Lastly, scale reliability is the proportion of variance attributable to the true score of the latent variable and is typically associated with Cronbach's (1951) coefficient alpha (DeVellis, 2003).

### **Approach**

#### **Techniques for encouraging honest responses**

For survey titles, Bandura (2006) advised using nondescript wording such as 'Appraisal Inventory', rather than including any references to 'efficacy'. The term 'Sustainability Pilot Survey' was used for the Phase 2 survey. It was also recommended that the opening paragraph should explain the importance of respondents' participation as a contribution to

research (Bandura, 2006), and that expected outcomes of the proposed research should also be explained (Remenyi, 1998, p.110). In the cover letter and opening paragraph I informed respondents that the knowledge provided would help to increase understanding and guide the development of programs for embedding sustainable thinking into workplace culture (Appendix A). Assurances of anonymity are also thought to encourage more honest answers (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). To preserve anonymity I ensured that respondents' personal details were not disclosed, and used a unique alphanumeric code to identify each respondent instead. I applied this coding method consistently in each phase.

### **Answer Format**

In deciding on the answer format, Bandura (2011) noted that a Likert-type scale is appropriate for phenomena that have positive and negative indicators, such as attitudes, opinions, and likes and dislikes, but not for self-efficacy. This is because a judgment of complete incapability (0) has no lower negative gradations (Bandura, 2011). He advised that it is better to use unipolar scales, ranging from zero to a maximum strength of belief; the argument being one cannot be less than completely inefficacious. However when I reviewed a number of more recent efficacy scale research papers, it was evident that Likert scales have been used extensively (see: Bohn, 2010; Yang, Cervero, Valentine, & Benson, 1998; Bogdanovic, 2008; Goddard & Goddard, 2001; Goddard, 2002). Therefore I used a 7 point Likert scale for all items (1 = strongly disagree to 7 = strongly agree) as this style is considered a good fit to the questions and is a familiar answer format to most of the respondent population. Finco, (where I conducted work on face validity in Phases 4 and 5), administers an annual employee engagement survey that also makes use of this same answer format.

With this approach I acknowledge that common method variance could be a threat to construct validity. Common method variance is 'the overlap in variance between two

variables attributed to the type of measurement instrument used, rather than due to a relationship between the underlying constructs' (Avolio, Yammarino, & Bass, 1991). Using a common answer format (7 point Likert) and the same anchors (Strongly Disagree: Strongly Agree) could have contributed to some bias (Podsakoff et al., 2003). The possibility of common method bias could be reduced in future studies by using different answer scales such as a 5 point Likert instead of 7 point Likert set for every item and/or changing formats such as using percentage agreement options.

There are a number of other causes of common method bias including measurement context (same timing, location, medium), item context (priming effects, embeddedness, scale length, context-induced mood, intermixing), item characteristic effects, (ambiguity, positive and negative phrasing), common rater effects (social desirability, consistency effect, leniency bias, illusory correlations) plus a number of others that could be affect the data (Podsakoff et al., 2003). Some of these are addressed in Section 5.4 Limitations in more detail.

### **Survey Time Requirements**

Cognisant of the time pressures of the workplace, the survey was designed to take no longer than ten minutes to complete. Most companies are not willing to allow employees extended time to complete a survey, because employees who are taken from their jobs to conduct surveys are no longer contributing to the productive capacity of the organisation (Bohn, 2010).

### **Sample selection**

Sample selection forms part of scale development quality assurance. A best-practices survey of EFA found that in a majority of the studies (62.9%) researchers performed analyses with respondent to item ratios of 10:1 or less, which is an early but still prevalent rule-of-thumb many researchers use for determining *a priori* sample size (Costello &

Osborne, 2005). I therefore applied a minimum of ten respondents per scale item (Bohn, 2010; Bryman & Cramer, 1997). The Phase 2 SES scale contained 16 items and CES scale, 17 items. Applying the best practices benchmark, the number of responses required was 170 (17 X 10), which is ten times the number of CES scale items of 17. See Table 3.2 for an analysis.

Table 3.2 Phase 2 Calculations of required and requested response rates per item

Phase 2	# items	# respondents required (X 10)	# surveys circulated - containing both SES and CES scales
SES	16	160	389*
CES	17	170	
*Circulated 266 surveys at Qualtrics and 123 at NBS companies			
See Appendix C for NBS companies' response rates.			

The Phase 2 survey was conducted with 292 respondents sourced from a network of companies in Canada and the USA. My co-supervisor initially approached contacts in each of nine Canadian companies that are part of the Network for Business Sustainability (NBS). Only four companies agreed to circulate the survey. I had hoped responses would number between 30 and 50 per organisation, ambitiously resulting in 450 to 750 responses. The number of responses collected was insufficient (92), and hence the survey was outsourced to a private research software company, Qualtrics, to raise the number of quality complete responses to 292. Qualtrics enables users to perform many kinds of online data collection and analysis including market research, customer satisfaction and loyalty, product and concept testing, employee evaluations and website feedback. Quantitative

statistical analysis performed with Qualtrics is cited in a number of professional and academic journals and books<sup>8</sup>.

The Phase 2 survey population comprised adults, (over 18 years of age), employed full time in organisations, and from across the full role hierarchy thus representative of the intended future live corporate environment populations. (See Appendix M for more detailed descriptive statistics of the demographics.) 71% of the sample frame (for Phase 2) were respondents sourced by Qualtrics and therefore sourced from multiple different organisations. This helped to reduce the risk of organization-level influence over groups of the respondents.

## **Procedure**

I sent a survey link and cover letter to nine members of the Network for Business Sustainability in Canada. I provided the company contact persons with an introductory text to circulate in an email to employees (Appendix A). The introductory paragraphs in the survey landing page in Qualtrics was adequate for their respondents and thus did not require a separate cover email.

Respondents of the sample population (NBS members and Qualtrics) were approached individually, resulting in self-report measures. The landing page contained a tick box for participators to indicate their agreement to participate. If this was not ticked, the respondent could not complete the survey. After respondents indicated their willingness to participate in the study, they were then screened as being in full time employment, and over 18 years of age. If successfully screened, they advanced to the next page which contained further information and instructions for completing the survey. The survey

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<sup>8</sup> References in Appendix G

requested respondents to read each item (as Per Table 3.1) and to indicate their answer by selecting a response category which they considered most appropriate. It is important to note that the respondents were answering the items in the context of their own organisations, providing perceptions of efficacy within the natural domain of their workplace. The demographics section required completion of respondents' details concerning their position in the company, department, tenure length, age range, race and gender. Other efficacy measures were not included in the survey, as these were not the focus of the pilot survey.

I did not set a limit to submit answers as this was the first round and I did not expect answers to be slow in coming in. I also did not expect missing data to be an issue as the electronic survey was designed so that a responder could not exit the survey before all Likert-style items had been answered. Messaging in the survey assured respondents of the confidentiality of their responses and they were acknowledged for their cooperation and participation in the study. Once surveys were completed the data were available for further analysis through the reporting function of Qualtrics.

For Phase 2 I distributed a total of 389 electronic surveys and received 292 (SES) and 281 (CES) usable responses, yielding a return rate of 75% (SES) and 72% (CES). Eleven of the respondents from the NBS companies neglected to complete the CES scale, hence the different response numbers recorded for these two scales. The survey mechanism did not force the respondent to complete the entire survey, thus some respondents may have tired and opted out. As I planned to analyse the scales separately I did not exclude the SES scales where the CES had not been completed. The return rate varied by company. Some of the NBS member companies returned 90% of the surveys, whereas others returned only 55%.

Table 3.3 Phase 2 Response Rate

Scale	# Required Answers (10 per item)	# Surveys circulated	Usable Responses	Response rate %
SES	160	389	292	75%
CES	170		281	72%

The Qualtrics respondents came from many different industries, ranging from agriculture to tourism. Gender response was reflected at 46% female and 53% male; 1% declined to identify gender. Racially, 2% identified themselves as African American, 79% identified themselves as Caucasian, 1% identified themselves as Native American, and 15% identified themselves as Latin American. Less than 1% identified themselves as Pacific Islander, and 3% declined to identify their ethnic background. Ages ranged from 20 to 76 years, and tenure from less than a year to 53 years. All job roles presented as options in the survey were present in the response set.

Data preparation was the next step in the process. This involved checking the data collected through Qualtrics for accuracy, transferring it into the predictive analytics software programme, IBM SPSS, and to Microsoft Excel, to facilitate statistical analysis. During the process of capturing the survey data in IBM SPSS and Microsoft Excel I was careful not to omit or manipulate the data. I managed the data in an unbiased manner, with no personal prejudices influencing the collection and analysis (Remenyi, 1998, p.111).

I excluded 21 responses I suspected were blind answered by identifying and excluding 'speeders', and those that answered in straight-line formation. I assumed where surveys had been answered in a very short time that respondents had not taken the time to read the items properly, and therefore the respondent was merely 'ticking boxes'. Any surveys

which had been answered in less than my predefined minimum execution time were excluded from the data pool to increase the overall quality of responses. The guideline provided by Qualtrics was 1/3<sup>rd</sup> of the average time taken by all the responses received in this soft launch period. Based on this guideline, the cut off time was calculated at two minutes. The number of usable responses in Table 3.3 above are stated after exclusion of 'speeders and box tickers.'

I then ran descriptive statistics on the clean data. The descriptive statistics function in IBM-SPSS helped to explain the basic features of the data in the study, providing simple summaries about the sample and the measures. I ran frequency reports to determine the number of respondents in different subgroups, and descriptive reports that detailed: Number, Minimum, Maximum, Mean, Standard Deviation, Skewness and Kurtosis. This enabled the description of the characteristics of the sample. Results are included in Appendix M.

Thereafter, I applied Cronbach's alpha methodology to calculate a coefficient of internal consistency (Santos, 1999) and therefore to assess the reliability of the SES and CES scales. Reliability is the ability of the survey to repeatedly produce the same results under the same conditions, and is as critical as validity in survey development (Field, 2003). Cronbach proposed splitting the data in two in every conceivable way and computing the correlation coefficient for each split. The average of these values is known as Cronbach's alpha, which is the most common measure of scale reliability (Field, 2003). A value of 0.7 upwards is viewed as an acceptable value (Field, 2003; DeVellis, 2003).

Construct validity was assessed using IBM-SPSS software to examine the empirical correlations between the items of the scale. In addition, the underlying structure of the scales was assessed using exploratory factor analysis (EFA). Principal components analysis (PCA) was used to extract the factors, followed by oblique rotation of factors using Oblimin rotation ( $\delta = 0$ ). Although PCA as an exploratory technique is subject to an ongoing

debate (see Gorsuch, 2003), Stevens (1996, 362-3) suggests that PCA is preferable as it is psychometrically sound and simpler mathematically. In addition it avoids some of the factor analysis issues with factor indeterminacy (Stevens, 1996, p.362-3). Moreover I followed the IBM-SPSS guidebook which recommends running PCA in its Factor Analysis chapter (Pallant, 2013). This process was also advised by a statistician whom I consulted on this process.

The number of factors to be retained was guided by three decision rules: Kaiser's criterion (eigenvalues above 1), inspection of the scree plot, and the use of Horn's parallel analysis (Horn, 1965). I ran this test as parallel analysis is considered one of the most accurate approaches to estimating the number of factors (Hubbard & Allen, 1987; Zwick & Velicer, 1986), and I used the software developed for this test by Watkins (2000). I contrasted the size of eigenvalues obtained from PCA to those obtained from a randomly generated data set of the same size. Only factors with eigenvalues exceeding the values obtained from the corresponding random data set were retained for further investigation.

I assessed the underlying structure of the scales using confirmatory factor analysis (CFA). Confirmatory factor analysis (CFA) is a more sophisticated test of whether a single factor can account for all of the variance in the data (Podsakoff et al., 2003). To run the CFA testing I used the software package Mplus Version 7.2, (under Windows), and for the analysis of latent variables, the Mplus statistical package.

## **Validation results**

### **Variability of Responses**

I examined the descriptive statistics on each of the 16 and 17 item scales. All items exhibited variability in response. Variability refers to selections made along the entire scale of 1-7, 'Strongly Disagree' through to 'Strongly Agree'. Thus I had no reason to drop any items for lack of variability.

## Reliability

The Cronbach alpha values for the 16 item SES scale was .926 and for the 17 item CES scale was .941. According to Gable & Wolf (1993) good affective instruments frequently report reliabilities ranging in the .70s, but that good cognitive measures have alpha reliability ranging from the high .80s to the low .90s. Both scales values exceeded the recommended value of .70 (Nunnally, 1978) indicating adequate internal consistency.

Table 3.4 Phase 2 Reliability Statistics

Phase 2 SES Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
0.926	0.937	16

Phase 2 CES Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
0.941	0.947	17

## Exploratory Factor Analysis (EFA): SES

I ran exploratory factor analysis on the combined data set. Factor analysis helps to answer how many factors underlie a set of items, and what the defining features of the factors are (Tabachnick, Fidell, & Osterlind, 2001). Each item's score was correlated with the total score for its particular self- or collective efficacy for sustainability scale. Those items showing statistically non-significant part-whole correlations were dropped from the final version of the scales. The Item-Total Statistics results are shown in Appendix B.

The 16 items of the Self-efficacy for Sustainability scale were subjected to principal component analysis (PCA) using SPSS version 22. Prior to performing PCA, the suitability of the data for factor analysis was assessed. Inspection of the correlation matrix revealed the existence of many coefficients above 0.3. The Kaiser-Meyer-Olkin value was 0.951, exceeding the recommended value of 0.6 (Kaiser, 1970, 1974), and Bartlett's Test of Sphericity (Bartlett, 1954) reached statistical significance ( $p < .001$ ), supporting the factorability of the correlation matrix.

Table 3.5 Phase 2 SES KMO and Bartlett's Test

Ph. 2 SES KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.951
Approx. Chi-Square		3192.122
Bartlett's Test of Sphericity	df	120
	Sig.	0

Principal component analysis revealed the presence of two components with eigenvalues exceeding one, explaining 55.27% and 9.64% of the variance respectively. An inspection of the scree plot revealed a clear break after the second component. Using Catell's (1966) scree test, it was decided to retain two components for further investigation. This was further supported by the results of the Parallel Analysis, which showed two components with eigenvalues exceeding the corresponding criterion values for a randomly generated data matrix of the same size (16 variables X 292 respondents X 100 replications).

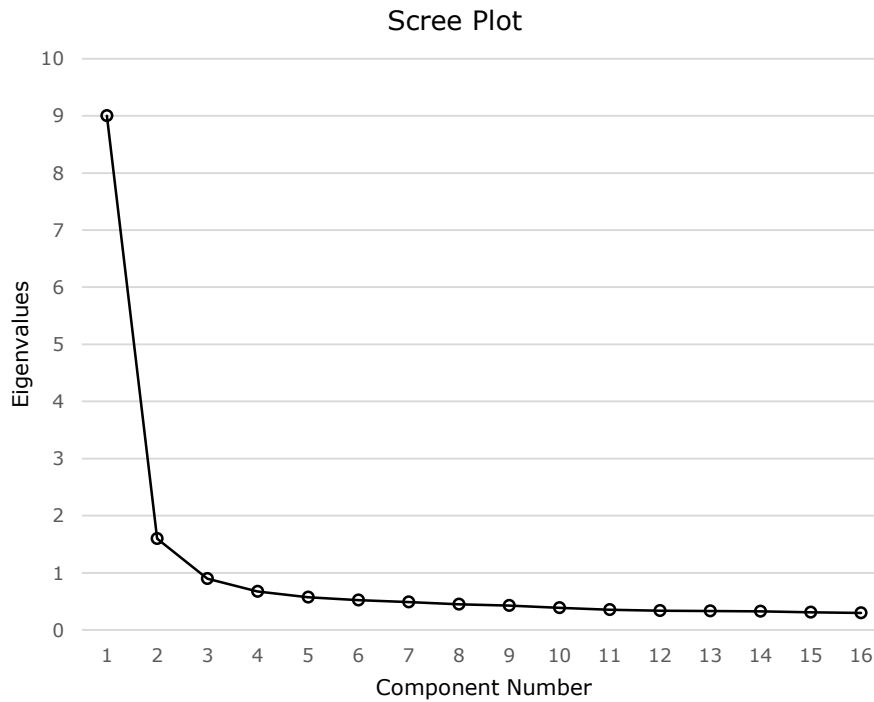


Fig 3.1 Phase 2 SES Scree Plot

The two-component solution explained a total of 64.91% of the variance, with Component 1 contributing 55.27% and Component 2 contributing 9.64%.

Table 3.6 Phase 2 SES Variances

Phase 2 SES Total Variance Explained							
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings <sup>a</sup>
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	8.844	55.274	55.274	8.844	55.274	55.274	8.834
2	1.542	9.637	64.911	1.542	9.637	64.911	1.730
3	0.830	5.189	70.099				
4	0.603	3.767	73.867				
5	0.526	3.290	77.157				
6	0.470	2.936	80.093				
7	0.450	2.810	82.903				
8	0.414	2.590	85.493				

Phase 2 SES Total Variance Explained							
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings <sup>a</sup>
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
9	0.388	2.422	87.915				
10	0.365	2.284	90.199				
11	0.310	1.940	92.139				
12	0.287	1.791	93.930				
13	0.268	1.678	95.608				
14	0.253	1.582	97.191				
15	0.234	1.461	98.651				
16	0.216	1.349	100.000				

Extraction Method: Principal Component Analysis.

a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

Oblim rotation was performed to aid in the interpretation of these two components. The rotated solution revealed the presence of a simple structure (Thurstone, 1947), with both components showing a number of strong loadings and all variables loading substantially on only one component. There was a weak positive correlation between the two factors ( $r = 0.124$ ), hence a similar solution would be expected from the Varimax rotation.

Table 3.7 Phase 2 SES Component Matrix Table

Component Correlation Matrix		
Component	1	2
1	1.000	.124
2	.124	1.000

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalisation.

Component Matrix <sup>a</sup>		
	Component	
	1	2
1. I am confident I can take the time to reflect on how my work needs to be adjusted to reduce my organization's negative environmental and social impacts.	.741	
2. I am confident that I can complete my work in a way that is in alignment with my organization's sustainability goals.	.751	
3. I am confident in making suggestions to my colleagues about ways to be more sustainable.	.813	
4. I am confident in my ability to make changes to my work that deliver on my organization's sustainability commitments.	.834	
5. At work, it is easy for me to stay positive about achieving our sustainability goals and aims.	.801	
6. I am confident that I can play a role in helping this company to become more sustainable.	.807	
7. I am confident in my ability to make changes in my daily tasks in order to work more sustainably.	.797	
8. In my work, I am confident that I can incorporate environmental, social and governance factors into my decision making.	.757	
9. I am confident in my ability to explain to my colleagues how sustainability relates to my work.	.804	
10. Even in the face of challenges, I am confident that I can undertake my work in a way that aligns with our organization's sustainability goals.	.824	
11. Even when there is limited support for the changes I am trying to make to improve the sustainability performance of our organization, I still persevere.	.801	
12. I am confident in my ability to alter the work that I do in a way that improves the sustainability performance of this organization.	.812	
13. The challenges to improving the sustainability of the work that I do are so great that I am unmotivated to pursue change (R)		.899
14. I am excited to try out new ways of working that will contribute to delivering on our organization's sustainability strategy	.799	
15. There's no point in me trying to improve the sustainability of the work that I do since it won't make a difference overall in our organization (R)	.335	.818
16. I am actively looking for opportunities to improve my organization's sustainability performance.	.703	

Extraction Method: Principal Component Analysis. / a. 2 components extracted.

On inspection of the Component Matrix Table all of the items load strongly (above .4) on the two components, (except for Item 15), which was thus eliminated for further testing. The results suggest a two factor solution is likely appropriate.

### **Exploratory Factor Analysis: CES**

The 17 items of the Collective Efficacy for Sustainability (CES) scale were subjected to principal component analysis (PCA) using SPSS version 22. Prior to performing PCA, I assessed the suitability of the data for factor analysis. An inspection of the correlation matrix revealed the existence of many coefficients above 0.3. The Keyser-Meyer-Olkin value was 0.955, exceeding the recommended value of 0.66 (Kaiser, 1970, 1974) and Bartlett's Test of Sphericity (Bartlett, 1954) reached statistical significance ( $p < .001$ ), supporting the factorability of the correlation matrix.

Table 3.8 Phase 2 CES KMO & Bartlett's Test

Phase 3 CES KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0.955
	Approx. Chi-Square	4218.021
Bartlett's Test of Sphericity	df	136
	Sig.	0

Principal component analysis revealed the presence of two components with eigenvalues exceeding one, explaining 59.33% and 11.60% of the variance respectively. An inspection of the scree plot revealed a clear break after the second component. Using Catell's (1966) scree test, it was decided to retain two components for further investigation. This was further supported by the results of the Parallel Analysis, which showed two components with eigenvalues exceeding the corresponding criterion values for a randomly generated data matrix of the same size (17 variables X 281 respondents X 100 replications).

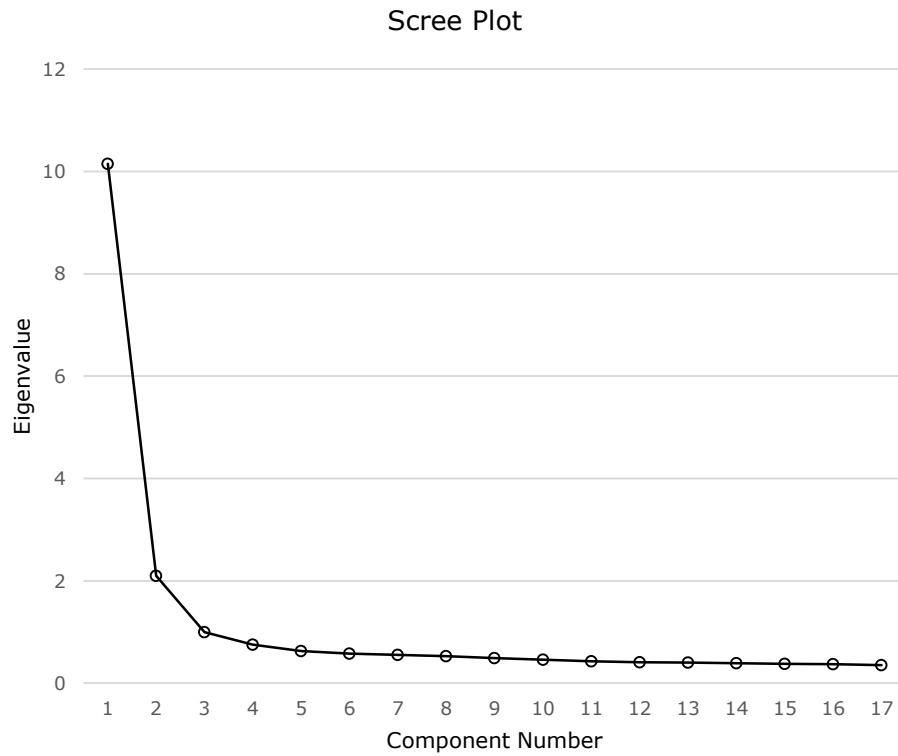


Fig 3.2 Phase 2 CES Scree plot

The two-component solution explained a total of 70.92% of the variance, with Component 1 contributing 59.33% and Component 2 contributing 11.60%.

Table 3.9 Phase 2 CES Variances

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	10.085	59.326	59.326	10.085	59.326	59.326	9.916	58.330	58.330
2	1.971	11.596	70.921	1.971	11.596	70.921	2.140	12.591	70.921
3	.805	4.736	75.658						

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
4	.587	3.455	79.112						
5	.438	2.574	81.686						
6	.415	2.443	84.129						
7	.388	2.281	86.410						
8	.337	1.983	88.393						
9	.305	1.797	90.190						
10	.268	1.575	91.765						
11	.258	1.518	93.283						
12	.246	1.446	94.730						
13	.231	1.360	96.089						
14	.191	1.123	97.212						
15	.169	.995	98.207						
16	.159	.936	99.143						
17	.146	.857	100.000						

Extraction Method: Principal Component Analysis.

To aid in the interpretation of these two components, I performed oblim rotation. The rotated solution revealed the presence of a simple structure (Thurstone, 1947), with both components showing a number of strong loadings and all variables loading substantially on only one component. There was a weak negative correlation between the two factors ( $r=.184$ ), hence a similar solution would be expected from the Varimax rotation.

Table 3.10 Phase 1 CES Component Matrix Table

Component Correlation Matrix		
Component	1	2
1	1.000	.184
2	.184	1.000

Extraction Method: Principal Component Analysis.

Rotation Method: Oblimin with Kaiser Normalisation.

Component Matrix <sup>a</sup>		
	Component	
	1	2
1. People in this organization can tackle our sustainability challenges.	.761	
2. This company has a strong vision for sustainability.	.863	
3. People in this organization are unsure of how they can contribute to our pursuit of sustainability		.779
4. When this organization takes on a sustainability goal we are confident of achieving it.	.837	
5. People across this organization have a clear idea of where we are headed with regard to sustainability.	.771	
6. As an organization, we are very certain about what we will accomplish together in the area of sustainability.	.852	
7. People across our organization have a strong commitment to make our organization more sustainable.	.852	
8. As an organization, we are unlikely to achieve many of our environmental and social goals.		.832
9. As an organization, we pursue our sustainability goals, even when times are tough.	.847	
10. This organization is confident about its future path to sustainability.	.866	
11. When resources are scarce, sustainability would be less of a priority for this organization.		.791
12. People across our organization would try to improve our environmental and social impacts even in times of cost constraint.	.824	
13. People in this organization are able to mobilize to meet difficult and complex sustainability goals.	.886	

Component Matrix <sup>a</sup>		
	Component	
	1	2
14. By working together, this organization can be a leader in environmental and social performance in its industry.	.832	
15. Our ability to work together makes me optimistic that we can improve our environmental and social efforts in this organization.	.883	
16. In this organization, everyone can work together effectively to meet our sustainability goals.	.860	
17. People in this organization are able to work together to reduce our environmental footprint and make a positive impact on communities.	.870	

Extraction Method: Principal Component Analysis. / a. 2 components extracted.

### **Confirmatory factor analysis (CFA)**

I subjected the scale results to a second level of testing for confirmatory factor analysis using a structural equation modelling software program Mplus Version 7.2. Although this research is not testing a hypothesis which is usually the appropriate situation for performing CFA, I ran it nonetheless to see whether the expected factors presented in the data.

### **CFA for SES**

While a non-significant chi-square can indicate a good model fit, in practice other factors can influence this figure, and therefore I assessed a range of fit statistics. For the incremental fit statistics (the Tucker-Lewis Index: TLI; and the Comparative Fit index: CFI) values less than .90 indicate lack of fit, values between .90 and .95 indicate reasonable fit and values between .95 and 1.00 indicate good fit (Pallant, 2013).

### **Four factor model (Capacity, Resilience, Understanding and Positive Outlook)**

The fit statistics for the four factor SES model were as follows: ( $p = 0.0005$ ); Chi-Square Test of Model Fit:  $X^2(48) = 87.147$ ,  $p < .05$ ; root-mean-square error of approximation (RMSEA) = 0.053 (considered an excellent fit); 90% confidence interval for RMSEA = (0.090; 0.035);  $p$  value for test of close fit (RMSEA = 0.05) = 0.375. Comparative fit index (CFI) was 0.983. Tucker-Lewis Index (TLI) was 0.976, both indicating an excellent fit. Standardised Root Mean Square Residual (SRMR) was 0.024. The standardised reliabilities were as follows: Capacity = 0.88, Resilience = 0.79 (Items #10 & #11 only), Understanding = 0.80 and Affective = 0.75.

Concurrent values lower than .08 for the RMSEA and greater than .90 for CFI for both the one and four factor models are reflective of having good and acceptable fits to the data (Medsker, Williams, & Holahan, 1994).

Secure in the results of the factor analysis, I interpret the meaning of these factors in the Table 3.11 and provide a brief discussion below.

Table 3.11 SES factors defined

SES Factors	Factor Definition
Capacity	An individual's perception of their ability to make changes to their everyday work that contribute to increasing their organisation's sustainability.
Understanding	An individual's perception of the level of their understanding of how to apply sustainability to their own and others' work.
Resilience	An individual's perception of their capability to recover from, or adapt to the effects of a change, and continue to make changes in everyday workplace behaviours to pursue organisational sustainability.
Positive Outlook	An individual's perception of their degree of positivity towards making changes in their everyday workplace behaviours to pursue organisational sustainability.

### Discussion of SES factors

Self- efficacy for sustainability is a judgment by an individual about their sense of capacity, understanding, resilience and positive outlook.

#### Capacity

An individual's perceived capacity to use their pathways to reach desired goals (agency) can be viewed as a motivating influence for behaviours (Snyder, 2002a). This self-referent way of thinking requires the mental energy to begin and continue using a pathway through all stages towards the goal (Snyder, 2002a). Wood and Bandura (1989) describe two types of capacity conceptions that individuals may hold. The first is the view of capacity as an incremental skill that can be continually improved by learning more and working on competencies. This type of individual seeks challenging tasks that provide opportunities to expand their abilities. The other view is that capacity is more or less a fixed inherent trait. These individuals are more concerned about taking on challenging tasks and falling short therefore tend to play it safe and choose tasks they believe suit the extent of their abilities. Ideally for building SES one would be of the capacity view that sustainability-related competencies can be learnt, as mastering a challenging task is the most powerful way to

build self-efficacy. I theorise that an individual who believes they have the capacity to make changes for sustainability has stronger SES.

### Understanding

Understanding the principles of sustainability helps an individual to identify what aspects they need to change about their work to improve the sustainability of what they do. Understanding sustainability also improves an individual's ability to explain and therefore help others to change, thus increasing the odds of success for broader sustainability integration across the organisation. It stands to reason that an individual with greater understanding should feel more confident in adjusting those processes under their own control since they believe they have a better understanding of 'what to do', or speaking about changing processes to others within the organisation. In this research, I suggest that employees' self-efficacy for sustainability is strengthened when they perceive they understand the role of sustainability in their own that of their co-workers' work, and how to apply this understanding to contribute to increasing sustainability in the workplace.

### Resilience

Resilience is well-established as both the source and result of efficacy and mastery (Sandage & Hill, 2001). 'Resilient self-efficacy requires experience in overcoming obstacles through perseverant effort', noted Bandura (2011). A resilient individual perseveres to complete difficult tasks which thus strengthens the belief in their ability to overcome future obstacles, or self-efficacy.

Considering resilience in the context of organisational sustainability, I suggest that change-making employees exhibit resilience in tackling business-as-usual processes, (such as a sole focus on the bottom line), and entrenched ways of working that hinder changes for sustainability. Furthermore, by continually fighting detractors for changes to be accepted into the broader organisation, being willing to be one of a minority in not

towing the company line, and potentially challenging leadership on difficult issues they develop resilience. These individuals are the models for sustainability change within organisations.

### Positive Outlook

A positive outlook includes optimism and the capability to see the spectrum of future possibilities that events carry with them (Bright, 1997). Additionally, an individual's emotional response to the idea of performing a recommended behaviour is their experiential attitude (Fishbein, 2007). Individuals with a strong negative emotional response to a behaviour are less likely to perform it, whereas those with a strong positive emotional reaction (positive outlook) are more likely to enact it. Additionally, research by Bissing-olson, Iyer, Fielding, and Zacher (2013) suggests that to some extent encouraging positive affect among employees could help organisations to promote pro-environmental behaviour in the workplace. A positive outlook therefore encourages individuals to try activities, thus building mastery, and hence self-efficacy through experiences of task completion. I theorise that having a positive outlook helps to build a sense of self-efficacy for sustainability.

### **CFA for CES**

#### **Three factor model (Collaboration, Resilience and Vision)**

In the testing of CES for a *three* factor model, two of the three reverse-coded items, (#3 and #8) were dropped as these items were causing poor fit. However, reverse-coded item 11 was kept as it is considered good practice to measure a factor (in this case 'Resilience') with at least three items.

The fit statistics for the CES model were as follows: Chi-Square Test of Model Fit:  $X^2(87) = 246.612$ ,  $p < .05$ ; root-mean-square error of approximation (RMSEA) = 0.081; 90%

confidence interval for RMSEA = (0.069; 0.093); p value for test of close fit (RMSEA = 0.05) = 0.000. Comparative fit index was 0.959 and Tucker-Lewis Index (TLI) was 0.951. Standardised Root Mean Square Residual (SRMR) was 0.031. The standardised reliabilities were as follows: Collaboration =0.95, Vision =0.93 and Resilience =0.81 (with items 9 & 12 only, item 11R was dropped).

Concurrent values lower than .08 for the RMSEA and greater than .90 for CFI for the one factor model is reflective of having good and acceptable fits to the data (Medsker et al., 1994). The three factor model is marginally over the RMSEA threshold of .08 at .081, but shows good CFI at 0.959. Secure in the results of factor analysis, I interpret the meaning of these factors in Table 3.12 below.

Table 3.12 CES factors defined

CES Factors	Factor Definition
Collaboration	An individual's perception of the extent of their group's ability to work together to make changes to everyday workplace behaviours to pursue their organisation's sustainability goals.
Vision	An individual's perception of the extent of their group's sharing of a common vision for achieving organisational sustainability.
Resilience	An individual's perception of the extent of their group's ability to recover from, or adapt to the effects of a change, and continue to pursue sustainability goals.

### Discussion of CES factors

Collective efficacy for sustainability is an aggregated judgment by group members about their sense of collaboration, vision, resilience.

#### Collaboration

Collaboration is a key judgement factor for individuals in assessing CES. Individuals will perceive that collaboration is necessary to successfully integrate any new sustainability-related policies, processes, and ways of being in the workspace due to the interdependent

nature of this work to succeed. Co-workers need to buy into new ways of operating and work together to make the 'new pieces fit together'. Much of the success centres on work task interdependency. Solutions that benefit and impact a whole organisation are rarely effective designed by only one or two employees (Bohn, 2010). In organisations groups must work together to achieve outcomes. The literature refers to organisations being increasingly dependent on teamwork (Blake, Manton & Allen, 1988; Mohrman, Cohen & Mohrman, 1995; Smith-Blancett, 1994; Solar, 2001 cited in San Martín-Rodríguez, Beaulieu, D'Amour, & Ferrada-Videla, 2005) and a number of researchers confirm that the success or failure of an organisation depends on how effective its employees are at collaborating in teams (Margerison & McCann, 1995; Smith-Blancett, 1994).

Through the lens of collective efficacy most, if not all, organisational tasks require collaboration due to the interdependencies inherent in organisational functioning. According to Thompson (1967) a group working on interdependent tasks are required to make ongoing spontaneous mutual adjustments to coordinate appropriately. This requirement fosters the social norms of cooperation, helping, and sensitivity to others' needs (Krebs, 1970), which in turn drives greater team work. Collective efficacy is created when synergistic group factors emerge from work task interdependency (Bandura, 2006). Following this line of thinking I theorise that employees' CES is strengthened when they perceive that they and their co-workers can work effectively together to achieve their (interdependent) sustainability goals.

### Resilience

As noted previously, resilience is both a source and result of efficacy (Sandage & Hill, 2001). Successful actions result in greater resilience, which encourages greater action and perseverance, and this effective action subsequently reinforces a sense of competence and efficacy (Sutcliffe & Vogus, 2003). A virtuous circle is created. Group level resilience relies on similar processes to resilience on the individual level, namely processes that promote

competence, encourage growth, and restore efficacy (Sutcliffe & Vogus, 2003). According to organisational theory, a group may be more resilient where they are 'oriented toward acquiring new skills, mastering new situations, and improving competence' (Sutcliffe & Vogus, 2003). I propose integrating sustainability requires learning new skills and acquiring additional knowledge, negotiating the integration of new processes throughout the existing business landscape, and improving competencies around systemic thinking and the broadening of the usual considerations inherent with business-as-usual operations. I theorise that employees' collective-efficacy for sustainability is strengthened when they perceive their group has the capability to bounce back in the face of obstacles and trials (Coutu, 2003) in their efforts to integrate sustainability.

### Vision

In Kemp and Martens' (2007) article on how to manage sustainable development visions are described as important, and perhaps even necessary, for system change. A clear, forward-looking sustainability vision can excite people, prompting their full commitment and energy (Doppelt, 2003). Furthermore, research shows that management's success in delivering sustained improvements through system-wide change in organisational culture is largely dependent on their ability to arrive at a shared vision (Schneider et al., 1996). Based on the literature, I suggest that employees' collective-efficacy for sustainability is similarly strengthened when they perceive their group shares a common vision for achieving organisational sustainability. In creating a clear and inspiring vision leadership provides employees direction and legitimises the actions necessary to pursue the vision, thereby encouraging greater action from the workforce.

To summarise this section: the psychometric properties of the self- and collective efficacy for sustainability scales are acceptable for this exploratory study. Model fit and reliabilities were good for all of the scales when modelled as both a single factor and multiple factors.

Factors of Capacity, Understanding, Resilience and Positive Outlook are proposed as the factors for SES; and Collaboration, Vision and Resilience for CES.

### **Scale refinement**

For both scales the reverse coded questions were the only items loaded on the second component. I suspect many of the respondents failed to realise the questions were negatively phrased. I excluded them from the data and further iterations of the testing as descriptively they were not designed to test a different factor from the balance of the questions.

SES item 1 was felt to have a very similar meaning to SES item 4, so was eliminated for parsimony of the scale. SES items 2 and 7 were dropped as they were causing a poor model fit during EFA. SES items 13 and 15 also caused a poor model fit during EFA and showed very low inter-item correlations scores (0.041 and 0.366). Moreover SES item 13 presented with negative inter-item scores in the correlation matrix.

SES 13. "The challenges to improving the sustainability of the work that I do are so great that I am unmotivated to pursue change."

SES 15. "There's no point in me trying to improve the sustainability of the work that I do since it won't make a difference overall in our organization."

SES Item 16. "I am actively looking for opportunities to improve my organization's sustainability performance." was dropped as on closer analysis it seemed more activity-related than reflective of an affective perception.

I dropped CES items 1, 4, 6, 10, 16 and 17 in the interests of parsimony, and/or to avoid similarity of meaning in the set of items. CES items 3 "People in this organization are unsure of how they can contribute to our pursuit of sustainability." and 8 "As an organization, we are unlikely to achieve many of our environmental and social goals." were

dropped as the reverse coding of the questions was causing poor fit in EFA analysis, with low inter-item correlations of 0.234 and 0.272 respectively. As noted previously CES item 11 “When resources are scarce, sustainability would be less of a priority for this organization.” was retained as despite having a poor fit in EFA analysis it is good practice to have at least 3 items for each factor. However I did reword CES item 11 positively to: “As an organization we still try to meet our sustainability goals, even when times are tough.”

Some items wording was amended for simplification of language. For example CES item 14 “By working together, this organization can be a leader in environmental and social performance in its industry”, was amended to CES item 7: “By working together this organization can be a sustainability leader in our industry”, thus removing the over complication of the phrase ‘environmental and social performance’. CES item 15. “Our ability to work together makes me optimistic that we can improve our environmental and social efforts in this organization”, was amended to CES item 4. “Because we work together, I am optimistic that this organization can improve its contribution to a healthier natural environment and a better society”, using more active and direct language like “I am optimistic...” and referring to a contribution rather and modifying this phrasing into plainer language. It is tempting to fall into using academic language when designing surveys during research however understandability is critical, so the simpler the language, (without losing nuanced meaning), the better.

Table 3.13 SES Items after Phase 2 amendments

SES SCALE ITEMS
1. I can change the way I work so that my company is more sustainable.
2. I can make suggestions to my colleagues on ways they can be more sustainable at work.
3. Even in the face of challenges, I can still make changes to my work in a way that supports my company's sustainability goals.
4. It is easy for me to remain positive about reaching our organizations sustainability goals.
5. I can make changes to the way that I work which will help deliver on my company's sustainability commitments.
6. I can explain how sustainability relates to my own work.
7. Even where there is limited support for the sustainability improvements I am trying to make, I persevere.
8. I feel excited about working in new ways in order to contribute to our company's sustainability goals.
9. I can be a part of making this company more sustainable.
10. In making decisions at work, I am confident I can take into account the natural environment, what it means for society, and good business practice.

Table 3.14 CES Items after Phase 2 amendments

CES SCALE ITEMS
1. People in this organisation are able to meet difficult and complex sustainability goals.
2. As an organization we still try to meet our sustainability goals, even when times are tough.
3. This organization has a strong vision for sustainability.
4. Because we work together, I am optimistic that this organization can improve its contribution to a healthier natural environment and a better society.
5. Even in times of budgetary constraint, employees still try to improve this organization's positive impact on the natural environment and society.
6. People across the organisation have a strong commitment to making this organization more sustainable.
7. By working together this organization can be a sustainability leader in our industry.
8. When financial and human resources are limited, sustainability stays a priority for this organization.

9. People across our organisation know what needs to be done to make this organization more sustainable.

### **3.1.3 Phase 3: Convergent and divergent validity testing**

Phase 3 details the trialling of the SES and CES surveys separately but with alternative scales with the objective of establishing divergent and convergent validity for each.

#### **Approach**

The SES and CES scales with their respective comparison scales were surveyed separately. Different populations of Qualtrics respondents answered each survey. I applied this split approach in an effort to reduce answer fatigue, and thus obtain better quality responses.

I purposefully used the nondescript title 'Sustainability Pilot Survey' in Phase 3 validation tests in line with recommendations for good efficacy research (Bandura, 2006).

#### **Item Amendments**

Items from post-testing Phase 2 did not require amendments before trialling in Phase 3.

#### **Divergent and convergent validity**

Many theorists regard construct validity as the all-encompassing, unifying concept for all types of validity evidence (Anastasi & Urbina, 1997; Cronbach, 1988; Guion, 1980; Messick, 1992). One of the most important construct validation techniques is determining whether scales exhibit convergent and divergent validity (Campbell & Fiske, 1959). To strengthening the rigour of the surveys in Phase 3 I conducted tests specifically to assess convergent and divergent validity.

Establishing divergent validity requires the dimensions of a construct to reflect distinct components. No constructs should be equivalent to another, even though they appear to be naturally related (Spreitzer, 1995). With divergence testing one expects to find weak

or negligible relationships between the SES or CES and other presumably unrelated measures. For instance in this research, SES and CES must be separately identifiable from self-esteem, even though appearing to be naturally related. Alternately, convergent validity is the extent to which the new scales correlates with other measures designed to assess similar constructs (Hinkin, 1998b). In this research SES and CES should correlate with similar constructs like general self-efficacy.

Literature confirms that EFA and CFA provide adequate evidence for convergent and divergent validity (Bagozzi, Yi, & Phillips, 1991; Hinkin, 1998b). Although Campbell and Fiske's (1959) Multitrait-Multimethod Matrix method would assist in *inter alia* demonstrating convergent and divergent validity, the CFA model allows methods to affect measures of traits in different degrees and to correlate freely among themselves (Hinkin, 1995). The CFA model has the following advantages: (1) measures of the overall degree of fit between the specified factor structure and data (e.g., the chi-square goodness-of-fit test), (2) useful information supplied as to whether and how well convergent and divergent validity are achieved (i.e., through assessing factor structure and correlates, and indices of model fit, such as chi-square, CFI, and RMSEA), and (3) explicit results available for partitioning variance into trait, method, and error components, that is through squared factor loadings and error variance (Bagozzi et al., 1991). For these reasons I applied the EFA and CFA method, rather than the Multi-trait-Multimethod Matrix. The analysis was run in Mplus version 7.

### **Identifying appropriate contrasting measures**

I followed a careful process to select the most appropriate scales to use in the Phase 3 survey. I examined efficacy scale development articles for the scales other researchers had used to determine convergent and divergent validity (see: Bohn, 2010; Bogdanovic, 2008; Chen, Gully, & Eden, 2001; Riggs, 1989). I noted the number of citations (in Google Scholar) for the relevant articles, the quality of the journals that published the article, and

the number of items in the scales. I steered away from overly lengthy scales to avoid answer fatigue as I wanted high quality responses. As an example, I considered but rejected Sherer et al.'s (1982) General Self-Efficacy Scale (SGSE) which had a lengthy 17 items. On the other extreme I excluded a single item self-esteem scale (SISE) developed by Robins, Hendin, and Trzesniewski (2001) for having too few items. Despite having over 1000 google scholar citations and being exceptionally convenient in terms of having only one item, I decided that a scale with a larger number of items would offer greater rigour.

I found it challenging to establish appropriate divergent scales as there is little clear guidance in the literature on how exactly to choose these scales. DeVellis (2003) describes divergent validity as the absence of correlation between two distinct constructs, using shoe size and anxiety as examples. I considered using the SES and CES scales themselves as divergent measures to each other, but this would not meet appropriate standards of rigour as these scales were not yet established. I eventually chose to follow the process used in Bauer et al.'s 2001 work on the Selection Justice Procedural Scale, where demographic variables, (gender, race, tenure and age), were used as divergent measures. Furthermore research has reported that gender, age and tenure variables are related to environmental attitudes and behaviour (Klein, D'Mello, & Wiernik, 2012) - another reason to use these as control variables in this particular study.

The final selection of instruments for assessing convergent validity required a trade-off of theoretical, practical and psychometric issues. I selected Chen et al's (2001) New General Self-Efficacy Scale (NGSE) for SES, and Riggs and Knight's (1994) Collective Efficacy Beliefs Scale (CEBS) for CES.

### **New General Self-Efficacy Scale (NGSE)**

I selected the NGSE after rejecting the Shwarzer and Jerusalem (1995) Generalised Self Efficacy scale (GSE) and Sherer et al.'s General Self-Efficacy Scale (SGSE). Although the

GSE has been used widely and consistently in the literature, the NGSE had fewer items, was cited over a thousand times and had a Cronbach's alpha of 0.85. Additionally the unit of analysis in NGSE, the individual, matched that of the SES scale.

Chen et al., (2001) developed the NGSE as they believed that existing and commonly used general self-efficacy measures had problems such as low content validity and multidimensionality. Their research concluded that the NGSE scale has higher construct validity than the SGSE scale, and demonstrated high reliability, predicted specific self-efficacy (SSE) for a variety of tasks in various contexts, and moderated the influence of previous performance on subsequent SSE formation (Chen et al., 2001).

Since general self-efficacy captures differences in how individuals tend to view their capabilities for meeting task demands in a broad array of contexts (Chen et al., 2001), it follows that NGSE underpins task-specific efficacy scales, such as SES. I therefore expected a correlation between the two, thereby establishing convergent validity.

### **Collective Efficacy Beliefs Scale (CEB)**

I selected the Riggs Collective Efficacy Beliefs Scale (CEB) for convergence testing with CES as it was also designed for an organisational setting, related to work-orientated tasks, and was focussed on the collective. I considered Bohn's (2010) Organisational Efficacy Scale, but due to its very low citing and high number of items (17) I rejected it in favour of the more established and succinct 7-item CEB scale. CEB showed good internal consistency reliability with Cronbach's Alphas of between 0.81 and 0.87 (Riggs & Knight, 1994), as well as predictive validity with measures of subsequent performance variables in a further pilot study (Riggs, 1989).

Table 3.15 Convergent and divergent measures

Scale	Convergent Scale	Divergent Measures
SES 10 items	New General Self-Efficacy Scale <ul style="list-style-type: none"> <li>• NGSE</li> <li>• 8 items</li> <li>• <math>\alpha = 0.85</math></li> </ul> (Chen et al., 2001)	Demographic variables <ul style="list-style-type: none"> <li>• Age</li> <li>• Tenure</li> <li>• Race</li> <li>• Gender</li> </ul>
CEB 9 items	Collective Efficacy Beliefs Scale <ul style="list-style-type: none"> <li>• CEB</li> <li>• 6 items</li> <li>• <math>\alpha = 0.81</math> to <math>0.87</math></li> </ul> (Riggs & Knight, 1994)	Demographic variables <ul style="list-style-type: none"> <li>• Age</li> <li>• Tenure</li> <li>• Race</li> <li>• Gender</li> </ul>

### Sample selection

Phase 3 validation was performed to assess convergent and divergent validity, (by way of CFA). By statistical procedures convention this required a greater number of responses than the 'rule of thumb' ten responses for every item (Costello & Osborne, 2005). Therefore I set the minimum number of responses per item at 15.

Although this 10-responses per scale item rule of thumb is widely used in practice, it is acknowledged that in general the bigger the sample the better (Pallant, 2013). As Gaskin and Happell (2014) note, there is basically no strong basis for set cut-offs on their own. Both the quality and nature of the data affect the analysis (Costello & Osborne, 2005; Gaskin & Happell, 2014) therefore it follows that there cannot be set rules. To reduce risk in subsequent phases I have erred on the side of larger rather than minimum sample sizes. See Tables 3.15, 3.17 and 3.25 for greater than minimum sample sizes.

Table 3.16 Phase 3 Calculations of required and requested response rates per item

Stage	Scales	# items	# respondents required (X15)	# surveys circulated	# usable responses
Phase 3a	SES	10	150	241	150
	NGSE	8	120		
Phase 3b	CES	9	135	163	135
	CEB	6	90		

SES and CES were surveyed separately, with their related divergent measures (demographics) and convergent test scales.

NGSE: New General Self-Efficacy Scale; CEB: Collective Efficacy Beliefs Scale

The survey population of 241 (SES) and 163 (CES) were sourced from Qualtrics, the research software company used in Phase 2 testing. Complete, usable responses numbered 150 (SES) and 135 (CES). The population was representative of the intended Phase 4 live corporate environment as screening was used to include only full-time employed adults, (over 18 years of age) - the same criteria used in Phase 2. A cross section of role hierarchy and industries was also apparent in this sample.

### **Procedure**

As a large number of responses was required, (15 per item), I engaged Qualtrics to collect responses. The sample population was approached individually, as a self-report measure. As in Phase 2, the survey had a tick box for participants to indicate their agreement to participate. If this is not ticked, the respondent could not complete the survey. Having indicated their willingness to participate in the study, respondents were provided written information and instruction for completing the survey. The survey requested respondents to read each statement and to indicate the response by selecting the response category that, in their opinion, they considered to be the most appropriate. Personal demographics were also requested. Respondents were assured of the confidentiality of their responses

and acknowledged for their cooperation and participation in the study. After respondents had completed the surveys, I was able to access the data for further analysis via Qualtrics' reporting functions.

## **Validation Results**

I reviewed the Qualtrics standard reports for any errors and for a good spread of respondents across demographics. There were no issues at this stage. Thereafter I exported to and edited the data in IBM-SPSS software. I eliminated variables related to collection information (dates, time etc.) from the data set as they were not required. I created totals for each scale and edited item labels for ease of reading. I also eliminated response sets where I suspected 'straight-lining'<sup>9</sup>; eight from SES and six from CES data sets respectively. A small number of speeder responses were also eliminated with the cut off time calculated at 70 seconds.

After editing, I had 150 (SES) and 135 (CES) sets of usable data. This size sample has adequate power to detect significant correlations of .20 or higher. Correlations below .20 are considered too small to be meaningful in defining the nomological network of constructs related to the SES and CES surveys (Pallant, 2013). The required number of responses and response rates achieved are represented in Table 3.17 below.

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<sup>9</sup> Respondents who ticked the same answer for every question, even for reverse coded questions.

Table 3.17 Phase 3 Response rates

Phase	Minimum Required Responses (15 per item)	# Surveys Circulated	# Usable Responses	Response rate
3a: SES	150	241	150	68%
3b: CES	135	163	135	97%

The main characteristics of the SES sample population's demographics were as follows: 51% were male, 49% female; 34% fell in the 25-34 age group, followed by 26% in the 35-44 years age group. 72% selected white for race and 14% black/African American. 39% of respondents were employees paid hourly, 33% salaried; and tenures ranged from a quarter of a year to 42 years. A broad range of industries from aerospace to video production were represented.

The main characteristics of the CES sample population's demographics were as follows: 46% were male, 54% female; 37% fell in the 25-34 age group, followed by 21% in the 35-44 year age group. 72% selected white for race and 12% black/African American. 37% of respondents were employees paid hourly, 38% salaried; tenures ranged from less than a year to 55 years. A broad range of industries from accounting to veterinary were represented.

### **Reliability**

I retested the reduced item SES and CES, and the NGSE and CEB scales for reliability. All scales had values exceeding the recommended value of .70, indicating adequate internal consistency (Nunnally, 1978).

Table 3.18 Phase 3 Reliability of Scales

Scale	SES	NGSE	CES	CEB
Cronbach's Alpha	0.966	0.940	0.937	0.825

### **Convergent and Divergent Validation**

The main objective of Phase 3 was to establish convergent and divergent validity. This section reports the results of the correlation analysis between the SES and CES scales and the selected comparison measures. A covariance estimate was sufficient to determine correlations as the comparison scales were included in the same survey instrument as the SES and CES scales (Nunnally & Bernstein, 1994). The following framework was used to describe the magnitude of correlation (Ary, Jacobs, & Razavieh, 1996):

- .00 to .19, negligible association
- .20 to .49, low association
- .50 to .69, moderate association
- .70 to .85, high association
- .86 to 1.00, very high association

### **SES**

I assessed convergent validity by correlating SES scores with NGSE scale scores, and expected them to correlate ( $r \geq .50$ ). Each respondent's scores for SES and NGSE scales were summed separately and then compared. I assessed divergent validity by correlating SES scores with demographic variables such as age (AGEB), tenure (TEN), race (RACE) (white=1, non-white=0) and gender (SEX) (male=1, female=0). The results are represented in Table 3.19 below.

Table 3.19 Phase 3 SES CFA Fit Indices & Factor Correlations

Chi-Square Test of Model Fit	
Value	330.196
Degrees of Freedom	208
P-Value	0

Table 3.19 Phase 3 SES CFA Fit Indices & Factor Correlations cont.

RMSEA (Root Mean Square Error of Approximation)		
Estimate	0.062	0.075
90 Percent C.I.	0.049	
Probability RMSEA $\leq$ 0.05	0.060	

Table 3.19 Phase 3 SES CFA Fit Indices & Factor Correlations cont.

CFI /LLI	
CFI	0.955
TLI	0.950

Table 3.19 Phase 3 SES CFA Fit Indices & Factor Correlations cont.

Factor correlations				
Two-Tailed				
	Estimate	S.E.	Est./S.E.	P-Value
SES WITH:				
NGSE	0.697	0.122	5.711	0.000
AGEB	-0.183	0.094	-1.936	0.053
TEN	0.091	0.712	1.279	0.201
RACE	-0.116	0.076	-1.535	0.125
SEX	0.002	0.037	0.058	0.954

Table 3.19 Phase 3 SES CFA Fit Indices & Factor Correlations cont.

Estimated correlation matrix for the latent variables					
	SES	NGSE	AGEB	TEN	RACE
SES	1.000				
NGSE	0.719	1.000			
AGEB	-0.130	0.000	1.000		
TEN	0.086	0.000	0.000	1.000	
RACE	-0.092	0.000	0.000	0.000	1.000
SEX	0.003	0.000	0.000	0.000	0.000

Based on these results the two factor model fits the data exceedingly well (CFI=.96, RMSEA=.06). SES is significantly and positively related to NGSE ( $r=.697$ ) which is evidence of convergent validity. SES is not significantly correlated to age ( $r=-.18$ ), tenure ( $r=.09$ ), race ( $r=-.12$ ), and sex ( $r=.00$ ) which is evidence of divergent validity.

### CES

I assessed convergent validity by correlating CES scores with CEB scores and expected to find a correlation ( $r \geq .50$ ). Each respondent's scores for CES and CEB scales were summed separately and then compared. Divergent validity was assessed by correlating CES scores with demographic variables such as age, tenure, race (white=1, non-white=0) and gender (male=1, female=0). The results are represented in Table 3.20 and below.

Table 3.20 Phase 3 CES CFA Fit indices & Factor Correlations

Chi-Square Test of Model Fit	
Value	320.123
Degrees of Freedom	134
P-Value	0

The chi-square result is significant which indicates poor model fit. However, chi-square is very sensitive to sample size and this may have affected the results. An extended sample could be performed to clarify this. This result is noted as a limitation in this research.

Table 3.20 Phase 3 CES CFA Fit indices & Factor Correlations cont.

RMSEA (Root Mean Square Error of Approximation)		
Estimate	0.097	0.111
90 Percent C.I.	0.083	
Probability RMSEA $\leq$ 0.05	0.000	

Table 3.20 Phase 3 CES CFA Fit indices & Factor Correlations cont.

CFI /TLI	
CFI	0.884
TLI	0.867

Table 3.20 Phase 3 CES CFA Fit indices & Factor Correlations cont.

Factor correlations				
Two-Tailed				
	Estimate	S.E.	Est./S.E.	P-Value
CES WITH:				
CEB	0.304	0.159	1.916	0.055
AGEB	-0.025	0.105	-0.239	0.811
TEN	0.084	0.688	1.223	0.221
RACE	-0.006	0.034	-0.183	0.855
SEX	0.051	0.04	1.279	0.201

Table 3.20 Phase 3 CES CFA Fit indices & Factor Correlations cont.

Estimated correlation matrix for the latent variables					
	CES	CEB	AGEB	TEN	RACE
CES	1.000				
CEB	0.088	1.000			
AGEB	0.092	0.000	1.000		
TEN	0.090	0.000	0.000	1.000	
RACE	0.083	0.000	0.000	0.000	1.000
SEX	0.083	0.000	0.000	0.000	0.000

Based on these results, the model moderately fits the data (CFI=.89, RMSEA=.097). CES has low significance and is positively related to CEB ( $r=.30$ ) which is marginal evidence of weak convergent validity. Five out of the six CEB questions are negatively worded. This may have had an impact on the results as negatively worded items can cause issues of fit when respondents do not recognise the negative associations. Even though the convergent correlation is not high, it is still higher than the divergent correlations. Although there is no hard and fast rule on how high or low the convergent or divergent measures need to be, convergent correlations must always be higher than the divergent correlations (Trochim, 2000). The fact this is evident here helps somewhat. CES is not significantly correlated to age ( $r=-.02$ ), tenure ( $r=.08$ ), race ( $r=-.01$ ), and sex ( $r=.05$ ) which is evidence of divergent validity.

This phase of the research could be strengthened by increasing the sample size and/or identifying and using different comparative scales to test whether one could improve the results for divergent and convergent validity for CES. All things considered, the scales likely measure unique constructs with the potential to add to our understanding of efficacy for sustainability in organisations.

## Scale refinement

No items were amended after this phase of testing.

Table 3.21 SES items tested in Phase 3

SES SCALE ITEMS
1. I can change the way I work so that my company is more sustainable.
2. I can make suggestions to my colleagues on ways they can be more sustainable at work.
3. Even in the face of challenges, I can still make changes to my work in a way that supports my company's sustainability goals.
4. It is easy for me to remain positive about reaching our organizations sustainability goals.
5. I can make changes to the way that I work which will help deliver on my company's sustainability commitments.
6. I can explain how sustainability relates to my own work.
7. Even where there is limited support for the sustainability improvements I am trying to make, I persevere.
8. I feel excited about working in new ways in order to contribute to our company's sustainability goals.
9. I can be a part of making this company more sustainable.
10. In making decisions at work, I am confident I can take into account the natural environment, what it means for society, and good business practice.

Table 3.22 CES items tested in Phase 3

CES SCALE ITEMS
1. People in this organization are able to meet difficult and complex sustainability goals.
2. As an organization we still try to meet our sustainability goals, even when times are tough.
3. This organization has a strong vision for sustainability.
4. Because we work together, I am optimistic that this organization can improve its contribution to a healthier natural environment and a better society.
5. Even in times of budgetary constraint, employees still try to improve this organization's positive impact on the natural environment and society.
6. People across the organization have a strong commitment to making this organization more sustainable.
7. By working together this organization can be a sustainability leader in our industry.
8. When financial and human resources are limited, sustainability stays a priority for this organization.
9. People across our organization know what needs to be done to make this organization more sustainable.

### 3.1.4 Phase 4: Face validity leading to further refinement

Phase 4 details the trialling of SES and CES scales in a live corporate environment to assess whether the scales would work well in practice and within one single organisation, thus further establishing face validity.

#### Approach

A key objective of this phase was to further establish face validity. Face validity does not refer to what a survey *actually* measures, but to what it *appears* to measure. Face validity assesses if the survey 'looks valid' to the respondents, the administrative personnel who decide how to use it, and other technically untrained observers. As an example, four non-academic lay persons, (parents at a soccer group), were asked whether the items made sense. Their general agreement that the items were understandable and made sense in terms of their understanding of sustainability at work added to the evidence for face

validity. I made no specific changes based on their feedback. I also discussed the items with three members of Finco management, before testing with the sub-set of employees. Management's feedback and the adjustments made in response are detailed in the next section.

### **Item amendments**

For the Phase 4 validation survey, management at Finco requested that I simplify the SES and CES items, both in structure and wording choice. Item modification for context is vitally important so that survey respondents to understand and identify with the descriptions in the items. I addressed this request in collaboration with Finco staff and my academic colleagues. I collaborated with Finco management on modifying of the survey to suit the requirements. By discussing these factors with management I was able to appropriately modify the landing page information, the language, flow and terminology used.

One example was the modification of the definition of organisational sustainability. The original definition provided was amended from:

*'a business approach that drives long-term corporate growth and profitability through proper consideration of environmental and social impacts, and good governance.'*

to:

*'Being sustainable is a business approach that drives long-term corporate growth through proper consideration of environmental and social impacts and good governance practices in order to create a fair and peaceful world for all, including our children.'*

Finco's sustainability manager felt a more positive message on sustainability was required hence the uplifting ending. From an organisation's perspective, management will be concerned whether employees feel efficacious about sustainability actions that are in line with their employer's specific interpretation of the definition. Thus it is important to modify the definition in line with the organisation wishing to use the survey. A core definition should be provided for the organisation to use or modify should they not already have their own. However any modification should occur within reasonable boundaries, such as retaining references to elements beyond solely profit making, environmental, social and governance factors.

More significantly, I simplified the item wording in the interests of receiving quality responses, and to make the scales more user-friendly from a practitioner point of view. Distilling items to their essential meanings helped in the rewording process without losing the essence of the item. For example I interpreted the essence of item, *"I can make changes to the way that I work which will help deliver on my company's sustainability commitments."* as *'ability to adjust work to deliver on sustainability'*. I amended the item to: *"I am confident that I can change the way I work so that my company is more sustainable."*

This not only simplified the language, but also removed the possible limitation where a respondents may not be aware of the company's commitments, or even the case where the company may not have any. See Table 3.23 below for a full set of the evolution of the items.

Table 3.23 Phase 4 Evolution of SES items

#	SCALE	PHASE 3 ITEMS TESTED	EXTRACTING ESSENCE	CONTEXT ADJUSTMENTS	PHASE 4 ITEMS TESTED (Finco)
1	SES	1. I can change the way I work so that my company is more sustainable.	I am confident that I can change the way I work so that my company is more sustainable.	No changes needed	I am confident that I can change the way I work so that my company is more sustainable.
2	SES	5. I can make changes to the way that I work which will help deliver on my company's sustainability commitments.	ability to adjust work to deliver on existing sustainability commitments	Wording: changed commitments to goals	I am confident that I can make changes to the way that I work which will support my company's sustainability goals.
3	SES	9. I can be a part of making this company more sustainable.	to be a part of making the organisation sustainable	No changes needed	I am confident that I can be a part of making this company more sustainable.
4	SES	10. In making decisions at work, I am confident I can take into account the natural environment, what it means for society, and good business practice.	factor in ESG into decision-making	Simplification of wording; added good business practice as company motto is 'x' (not to be disclosed here). Term: 'legislation' added	I am confident that in making decisions at work, I am able to take into account the environment, society, legislation and good business practice.
5	SES	2. I can make suggestions to my colleagues on ways they can be more sustainable at work.	sustainable tips to colleagues	Wording: added 'at work' to contextualise boundaries	I am confident that I can make suggestions to my colleagues on ways they can be more sustainable at work.
6	SES	6. I can explain how sustainability relates to my work.	explain own role on sustainable performance	Simplification of wording; added the word 'own' work	I am confident that I can explain how sustainability relates to my own work.
7	SES	3. Even in the face of challenges, I can still make changes to my work in a way that supports my company's sustainability goals.	work sustainably even if it is hard	Simplification of wording; wording changed organization to company	Even in the face of challenges, I can still do my work in a way that supports my company's sustainability goals.
8	SES	7. Even where there is limited support for the sustainability improvements I am trying to make, I persevere.	keep trying to be sustainable even if there is little support for it.	Simplification of wording; personalization "there is limited support' to 'when others don't support..."	Even when others do not support me in my sustainability efforts, I still persevere.
9	SES	4. It is easy for me to remain positive about reaching our organizations sustainability goals.	positive mindset on working sustainably	Wording: organization to company; simplification of	I am confident that I can remain positive about supporting my company's sustainability goals.

#	SCALE	PHASE 3 ITEMS TESTED	EXTRACTING ESSENCE	CONTEXT ADJUSTMENTS	PHASE 4 ITEMS TESTED (Finco)
				wording in first phrase	
10	SES	8. I feel excited about working in new ways in order to contribute to our company's sustainability goals.		Deleted this item: duplicated concepts with other items 1,5,9; and in interests of brevity	No item

Table 3.24 Phase 4 Evolution of CES items

#	SCALE	PHASE 3 ITEMS TESTED	EXTRACTING ESSENCE	CONTEXT ADJUSTMENTS	PHASE 4 ITEMS TESTED (Finco)
1	CES	1. People in this organization are able to meet difficult and complex sustainability goals.	employees take action to achieve sustainability goals	wording: organization to my company; simplification of wording	People in my company are able to successfully address difficult and complex sustainability issues.
2	CES	4. Because we work together, I am optimistic that this organization can improve its contribution to a healthier natural environment and a better society.	working together we can improve company's sustainability	Simplification of wording: changed healthier natural environment and a better society to 'a more sustainable environment'	Because we work together, I am optimistic my company can improve its impact on creating a more sustainable environment.
3	CES	7. By working together this organization can be a sustainability leader in our industry.	working together company can be an industry leader in sustainability	Wording change: organization to my company	By working together my company can be a sustainability leader in our industry.
4	CES	2. As an organization we still try to meet our sustainability goals, even when times are tough.	Sustainability goals are chased, even when times are tough	Simplification of wording "still try to meet" to "strive to reach"; Wording change: organization to my company	As a company, we strive to reach our sustainability goals even when times are tough.
5	CES	5. Even in times of budgetary constraint, employees still try to improve this organization's positive impact on the natural environment and society.	when there are limited financial resources, sustainability goals are still driven	Colloquialism of wording around budgetary constraint to 'tough financial year'; organization to my company; broadened into aspects of legislation and good business practices	Even if my company is having a tough financial year, staff still strive to make a positive impact on environment, society, legislation and good business practice challenges facing us.
6	CES	8. When financial and human resources are limited, sustainability stays a priority for this organization.	when there are limited financial/ human resources sustainability is still a priority	No changes needed	When financial and human resources are limited, sustainability stays a priority for this organisation.

#	SCALE	PHASE 3 ITEMS TESTED	EXTRACTING ESSENCE	CONTEXT ADJUSTMENTS	PHASE 4 ITEMS TESTED (Finco)
7	CES	3. This organization has a strong vision for sustainability.	This company has a strong vision for sustainability.	No changes needed	My organisation has a strong vision for sustainability.
8	CES	6. People across the organization have a strong commitment to making this organization more sustainable.	there is a commitment to sustainability	Wording: people changed to the staff; organisation to company	The staff in my company have a strong commitment to making this organisation more sustainable.
9	CES	9. People across our organization know what needs to be done to make this organization more sustainable.	clear idea of what needs to be done	Wording: people changed to the staff; organization to company	The staff in my company know what needs to be done to make this organisation more sustainable.

During the modification of items, I assessed whether employees at all levels of job grades would understand the terminology used in the survey. To assist with this I engaged with Finco's Business Marketing Intelligence manager and Sustainability manager for their assessment on the language used, and how this would be understood across the organisation. Terms discussed included: ESG, sustainability, strategy, governance and others. I kept some more complex terminology, but grouped others under the blanket term 'sustainability' to test how respondents would respond to the different terms. I prefixed many of the items in the SES scale with "I am confident that..." to bring focus to the individual and the feeling of "I am able to" (efficaciousness). Besides various rewording, one Phase 3 SES item: "I feel excited about working in new ways in order to contribute to our company's sustainability goals." was removed in the interests of brevity, resulting in nine SES and nine CES items to be tested.

I questioned whether these amendments would render statistical results from Phase 2 and 3 obsolete, however on reflection I felt that the items were similar enough that the results of EFA and CFA testing would work similarly to the previous results.

## Sample selection

The sampling frame was a group of 2831 employees of a major listed entity in the financial sector in South Africa. I refer to the entity as “Finco” in the interests of anonymity. The sample selection included employees from different divisions as recommended by the strategy department, being the sponsor of the research. The study was cross-sectional in nature, incorporating most levels of the organisational hierarchy, (bar the two highest job grades).

### Response Rates

According to the Human Resources department of Finco, historical staff engagement survey response rates have been in excess of 70%. This is considered a very good response rate, and I therefore I also expected to receive a decent number of responses to my survey. To encourage a good response rate, I included an explanatory cover email with the survey link, (see Appendix C2).

Table 3.25 Phase 4 Calculations of required and requested response rates per item

Phase 4: Live corporate environment validation	# Items	# Respondents required (X 10)	# Responses requested
SES	9	90	2831
CES	9	90	
SES & CES were surveyed together.			

## Procedure

In relation to access, Finco had agreed to be a research subject for UCT's SEEC<sup>10</sup> research group, subject to a non-disclosure agreement. As a member of SEEC, I was introduced to a contact in the company by my supervisor. During the month as an intern in the strategy department I became acquainted with members of the sustainability department. The concept of the survey was presented to the relevant persons in this department (see Appendix C for the promotional document). The survey concept was also presented to the Human Resources department, Business Marketing Intelligence department (BMI) and the Board, all of who ultimately approved the project.

To obtain a better quality of answers I felt it would be beneficial to provide further information on Finco's sustainability. I provided respondents with this information by including a click through link to a 'further information' page, with details of the company's sustainability goals and projects. A definition of 'sustainability' as understood by Finco was also included. I believe this provided enough contextual information but did not overload the survey pages with text. As an aside, I also felt this might be an educational opportunity for employees to receive information on their company's sustainability vision and projects.

Other amendments included adjusting the demographics for applicability to Finco employee profiles and including a free-form answer space for suggestions. Respondents were also given the option to opt out of the survey. See Appendix C for the 'further information' page and survey.

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<sup>10</sup> Sustainable Enterprise and Emergent Change <http://gsbblogs.uct.ac.za/seec/>

The BMI department created the survey in their own survey software, Survey Monkey. I reviewed it a number of times for ease of use, language, flow and completeness. I used the nondescript title 'Sustainability Survey' (Bandura, 2006). The BMI department manager sent an email containing an explanatory note and the link to the survey to employees (Appendix C). After receiving a large number of responses in the first few days I decided to set the time frame for the survey at one week only. As a large number of responses was received within this time period, no follow up email was required.

The BMI department downloaded the data from the survey software, collated it in Microsoft Excel and sent it to me. I cleaned the data by removing incomplete or particularly speedy responses. The cut-off time for speeders was calculated at two minutes. I uploaded the data into statistics software IBM-SPSS version 22 for further analysis. My exploratory analysis was also conducted in Microsoft Excel.

## Validation Results

### Response rates

Of the 2831 employees surveyed, 787 and 781 responded with complete data sets for SES and CES respectively, a 28% response rate. This number of responses was statistically acceptable for the intended tests. All 22 departments surveyed were represented in the responses received.

Table 3.26 Phase 4 Response Rates

Phase	Required Items (x 10)	# Surveys Circulated	# Useful responses received	Response rate %
SES	190	2831	787	28%
CES	190	2831	781	28%

### Treatment of missing data

Although previous iterations of the survey had been designed to ensure respondents answered all items before exiting, Phase 4 respondents were able to exit the survey without filling in all the answers. This was due to an error in designing the survey in the company's survey software. 28 SES and 32 CES incomplete responses in the Phase 4 sample were excluded from the results. Response numbers (787 for SES and 781 for CES) were still adequate after their exclusion. I acknowledge a limitation in terms of my treatment of incomplete data cases. In retrospect I could have used Full-information maximum likelihood (FIML), which enables the software to make use of the data of incomplete cases (Muthén & Muthén, 2001). Applicable across a broad array of data analysis scenarios, FIML usually outperforms common ad hoc missing data-handling methods, such as listwise deletion (Arbuckle, 1996; Wothke, 2000) which I applied in this research.

### Exploratory Analysis

Here I performed some exploratory analysis to assess the level of self- and collective efficacy for sustainability among the employee population, and to see how SES and CES were represented across the different demographic groups.

I calculated the average SES and CES scores by taking the sum of individual answers of each scale, and dividing it by the number of answers within the particular scale (Sekaran, 1992, p. 261). The scores indicate on average a healthy efficaciousness in the surveyed population, scoring just under six - the marker for 'Agree' - for each. SES is marginally stronger than CES by 2%. Individual scores per item are shown in Appendix F.

Table 3.27 Finco Self- and Collective Efficacy for Sustainability Scores

Phase 4 Scores	SES	CES
All Items	5,945	5,817
	"Agree"	"Agree"

I ran reliability reports and ANOVA tests in IBM-SPSS with good results contributing further evidence of validity of the items in this stage of their evolution. The reliability report run on the company's SES and CES scales showed strong results in terms of Cronbach's Alpha at .938 and a mean inter-item correlation of 0.626 for SES; and Cronbach's Alpha at .929 and a mean inter-item correlation of 0.598 for CES. The results of these tests demonstrate that these amended items still have desirable statistical properties when edited to fit the organisational contexts.

Table 3.28 Scales Reliability and Item Statistics

Finco: SES Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
0.938	0.938	9

Finco: CES Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardised Items	N of Items
0.929	0.931	9

Finco: SES Summary Item Statistics							
	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Inter-Item Correlations	0.626	0.493	0.817	0.323	1.655	0.007	9

Finco: CES Summary Item Statistics							
	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Inter-Item Correlations	0.598	0.437	0.754	0.317	1.727	0.007	9

In addition, I performed an exploratory analysis of SES and CES against selected demographical variables, (gender, age, tenure, job grade and business unit), to explore which cross-sectors of the employee population may show stronger or weaker SES and CES. No startling or unexpected results were evident in these tests. See Appendix C. 3 for results.

#### ANOVA testing

I assessed the relationship of demographic variables to self- and collective efficacy for sustainability by using one-way analysis of variance (ANOVA), which essentially tests whether there are significant differences in the mean scores.

All demographic variables were in grouped formations. After running ANOVA tests, there were no statistically significant differences at the  $p < .05$  level in SES scores for Gender, Age, Race, Job Grade or Business Unit, or for any of the variables for CES. For the groups in these variables, the significance value for the Levene test was less than .05 therefore violating the assumption of homogeneity of variance; and/ or the ANOVA significance value was greater than .05, indicating no significant differences between the groups (Pallant, 2013). It is beyond the scope of this study to explore alternative non-parametric tests that would in other circumstances follow the violation of the Levene test.

However, there were statistically significant differences at the  $p < .05$  level in SES scores for the Tenure groups:  $F(5, 781) = 2.857, p = .014$

Table 3.29 ANOVA test

Tenure	Group
Less than 1yr	1
1 – 3yrs	2
3 – 7yrs	3
7 – 15yrs	4
15yrs+	5
Not indicated	6

Finco: SES Test of Homogeneity of Variances: Tenure			
TSES9			
Levene Statistic	df1	df2	Sig.
1.518	5	781	0.182

ANOVA					
TSES9					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.444	5	1.889	2.887	0.014
Within Groups	511.035	781	0.654		
Total	520.478	786			

Levene Statistic was greater than .05 therefore not violating the homogeneity of variances. ANOVA significance was less than .05 therefore indicating significant differences in some groups. These were Groups 2: "1 – 3yrs" and Group 4: "7 – 15yrs"; and Group 3: "3 – 7yrs" and Group 4: "7 – 15yrs".

Despite reaching statistical significance, the actual difference in mean scores between the groups was quite small. The effect size, calculated using eta squared, was .02, which is considered a small effect (Cohen, 1988, pp.284-7). Post-hoc comparisons using the tukey HSD test indicated that the mean score for Group 2 (M=6.04, SD=0.72) was significantly different from Group 4 (M=5.76, SD=.94); Group 3 (M=6.00, SD=0.82) was significantly different from Group 4 (M=5.76, SD=0.94). Group 1 (M=6.06, SD =0.64), Group 5 (M=5.95, SD =0.78) and Group 6 (M=6.07, SD =0.80) did not differ significantly from the other groups.

Table 3.30 Tenure Group Differences

Group	Tenure	Mean
4	7 - 15yrs	5.76 <sup>d</sup>
5	15yrs+	5.95 <sup>c</sup>
3	3 - 7yrs	6.00 <sup>b</sup>
2	1 - 3yrs	6.04 <sup>a</sup>
1	Less than 1yr	6.06 <sup>c</sup>
6	Not indicated	6.07 <sup>c</sup>
Same superscripts on mean indicates statistically similar groupings		

23% of the Tenure responses came from Group 4, so this should not have had a skewing effect on the results. Further investigation into those in the 7-15 years Tenure group may provide insight into why their SES is relatively lower. Finco management advanced a theory that newer employees had been exposed to more sustainability information and training through their more recent induction processes. Those in the 7-15 year Tenure group had probably not had any sustainability related matters in their induction as it was not something that many companies were paying attention to back then. Programmes could be designed in such a way as to increase the efficacy of this population grouping. Another theory proposed was that those with the longest Tenures (Group 5) would likely be more senior and therefore exposed to strategic aspects of sustainability in their functions.

## **Scale refinement**

There were no post-testing amendments to the SES and CES scales in this Phase.

### **3.1.5 Phase 5: Face validity of a reduced scale**

Phase 5 details the trialling of the SES and CES surveys with a population of MBA students to reinforce face validity, and further modify items based on the qualitative analysis of the free-form answers. The main objective of this phase was to assess if respondents understood and interpreted the items as intended. This was achieved by examining and comparing free-form content with item scores.

## **Approach**

### **Survey amendment**

In this phase, I was interested in *why* respondents were scoring the items as they did, rather than the actual item scores. To facilitate this analysis, I divided up Phase 4 18-item survey into six separate surveys containing three items each, with a free-form space after each item asking: “Can you please explain why you rated this question as you did?” My strategy in dividing up the survey was that respondents would spend more of their limited allocated class time answering the free-form answers, rather than scoring a large number of items.

### **Sample selection**

My co-supervisors facilitated access to 118 MBA students enrolled at the business schools of UCT and SFU. I was confident students would be over 18 years old, and would mostly have some experience of full-time employment and working within organisations across various industries.

## Procedure

I created the surveys in Qualtrics survey software. The survey was titled 'Sustainability in the Workplace' in line with Bandura's recommendation to use a nondescript title and to omit the word 'efficacy' (2006). On the introductory page I asked students to think about sustainability as follows:

*"a business approach that explicitly acknowledges the need to take into account broader environmental and social factors over longer time frames, resulting in a broader understanding of value creation."*

A link to the survey was sent to students' university email addresses. The respondents were briefed on the nature and purpose of the survey in class.

Respondents then had 15 minutes of allocated time in class to access their email, click on the link and individually complete the survey. Those not present in class, received the survey by email and completed it in their own time. Dr. Bertels (for SFU) and I (for UCT) were present during the sessions or available by email to answer questions from the students. Respondents were clearly informed of the voluntary nature of their participation and were required to tick a box in the survey to indicate their willingness to continue with the survey. The survey also assured respondents of the confidentiality of their responses and they were acknowledged for their cooperation and participation in the study.

## Results

I received 76 responses from 118 sent to MBA students, an acceptable 64% response rate. As I had divided the 18-item Phase 4 survey into six 3 item surveys, I received between three and 13 answers for each item. Free-form answers were set as forced answers in the survey software, which meant I received higher quality, completed answers. However two respondents' answers were excluded as the content made little sense. I downloaded the

completed surveys from Qualtrics survey software and saved the data in Microsoft Excel for further analysis. During this process, I made no attempt to omit or manipulate, and thus distort the data (Remenyi, 1998, p.111).

South African-based UCT survey respondents were aged between 25 and 44; with a 2.7:1 male to female ratio and from diverse range of industries such as asset management through to telecommunications. Racial demographics reflected 26 white and 17 black respondents. Canadian-based SFU survey respondents were aged between 25 and 44; with a 55:45 male to female ratio and from diverse range of industries such as healthcare through to banking. Racial demographics reflected 73% white and the balance as South Asian and Southeast Asian respondents.

I analysed the item scores against free-form answers, as well as paying careful attention to the content. Where the answers did not seem aligned with the score, I interrogated why this might be the case, discussing these with my supervisor. In some instances I assessed it might be due to a misinterpretation caused by the wording of the item itself, in others it appeared the respondent had not understood, or had not provided adequate information for interpretation.

Some examples of item wording challenges included:

- References to 'all staff' rather than to a smaller body of employees, ('my colleagues'). The respondent may not have had adequate exposure to 'all staff' and therefore felt unable to express an opinion.
- References to the organisations 'sustainability goals', where the organisation may not have any formalised goals or, if they did exist, where respondents were not aware of them.
- References to 'tough financial times', where respondents had not been through the experience.

- Items containing multiple concepts created challenges for respondents to answer: for instance: “I am confident that in making decisions at work, I am able to take into account the environment, society, legislation and good business practice.”

After this high level review I grouped *Strongly Disagree*, *Disagree* and *Somewhat Disagree* scale scores as Low Agreement; *Neither Agree nor Disagree* as Neutral Response; and *Somewhat Agree*, *Agree* and *Strongly Agree* as High Agreement. Then I listed and assessed all quotes against these scale score groupings. I added an extra category “Unidentified” for where I had difficulty interpreting the response. By reviewing the items with misaligned responses, I was able to identify and amend items to better convey their meaning to respondents. I prepared an analysis of quotes against scale scores. Based on these judgements, the agreement between quotes and scale scores was in the region of 78%.

Table 3.31 Phase 5: Analysis of Quote and Scale Agreement

	#	Low Agreement	Neutral Response	High Agreement	Unidentified
Total quotes	242	51	18	121	52
# quotes aligned with scores	189	51	17	121	
% quotes aligned with scores	78%				

As an example, for the CES item: “People in my company are able to successfully address difficult and complex sustainability issues”, I assessed four High Agreement scores, three for Neutral Response, and two for Low Agreement out of a total of 11 quotes. The remaining two quotes could not be clearly aligned with scale scores. This resulted in a high alignment of 82%, which I took as evidence of a well understood and interpreted item.

Based on this exercise I amended various items. For instance for the CES item: “The staff in my organisation know what needs to be done to make this organisation more sustainable”, alignment between quotes and scale scores was at a low 50%. To address this I amended the item to: “If they chose to do so, I am confident my colleagues have the right capabilities to make this organization more sustainable.” See Appendix I for the full set of items alignment scores.

Table 3.32 Examples of survey quotes supporting Low, Neutral or High Agreement

SES sample quotes	
SES Item	1. I am confident that I can change the way I work so that my organisation is more sustainable.
Low Agreement	...in the role I currently have, and with the fragmentation of departments and sectors currently present, the cost involved would probably stop that initiative before it can even get off the ground.
Neutral Response	none
High Agreement	I strongly agree because I am the business leader in my firm so it should be possible for me to make a change
SES Item	2. I am confident that I can be a part of making this organisation more sustainable.
Low Agreement	...my ability to make changes in this organization which is a public health institution would be difficult or hindered by the current organizational culture which exists there. It is fairly rigid and not easily adaptable. I am also not in a particularly important or influential decision making position and as such my influence is limited
Neutral Response	none
High Agreement	I feel confident I am empowered to influence the strategic direction of my organization including sustainability
SES Item	3. I am confident that I can make suggestions to my colleagues on ways they can be more sustainable at work.
Low Agreement	I feel that even though I may feel comfortable enough to make suggestions, I believe that they would not actually be heard or that anything would be done about it.
Neutral Response	none
High Agreement	I'm possessed of the requisite knowledge and passion, and I speak loudly and often.
SES Item	4. I am confident that I can remain positive about supporting my organisation's sustainability goals.

SES sample quotes	
Low Agreement	...my perception that the company is failing to look forward and think sustainably has led me to resign very recently. Part of the reason I did so was concern that I could not maintain positivity regarding the current circumstances--no sustainability goals that I am aware.
Neutral Response	none
High Agreement	...the few [goals] that we do have - we do enthusiastically as the benefits are obvious. Since my organisation is positive about it, I am positive too.
SES Item	5. Even when others do not support me in my sustainability efforts, I still persevere.
Low Agreement	At this point in my business's life cycle the main priority is immediate profit.
Neutral Response	none
High Agreement	I'm only human - I don't always act in alignment with my values if it's tough, inconvenient or incompatible with others. However, I believe that I am usually willing to do what I consider to be the right thing, even if it's unpopular
	If you are truly passionate about something, a few naysayers will not dislodge your belief
SES Item	6. I am confident that in making decisions at work, I am able to take into account the environment, society, legislation and good business practice.
Low Agreement	In a consulting role I am required to take into account the client's external context but to the extent that such context is external to my own I have a very limited impact in shaping how a client's company makes decisions around sustainability.
Neutral Response	none
High Agreement	Locally we take into account good practice, environment, society and we have flexibility there
SES Item	7. I am confident that I can make changes to the way that I work which will support my organisation's sustainability goals.
Low Agreement	none
Neutral Response	My role is highly geared towards improving operational performance, which may affect our ability to remain an employer.
High Agreement	Though there are set procedures to do things at work there have been incremental changes that have happened with my contribution so if I can change the way I work I could influence some things
SES Item	8. Even in the face of challenges, I can still do my work in a way that supports my organisation's sustainability goals.
Low Agreement	...there is also no clear measure or sustainability goals that I can easily recall. The only clear unambiguous goal within the organisation is the financial target.
Neutral Response	It all depends of the extent of the challenge.
High Agreement	It depends what kind of challenges however, I see no impediment as there are clearly set out frameworks to assist in the accomplishment of set targets.

SES sample quotes	
SES Item	9. I am confident that I can explain how sustainability relates to my own work.
Low Agreement	none
Neutral Response	none
High Agreement	I am responsible for business improvement, and as part of our business planning and long-term strategy, we do consider various aspects of sustainability.

CES sample quotes	
CES Item	1. If they chose to do so, I am confident my colleagues have the right capabilities to make this organization more sustainable
Low Agreement	Sustainability was never identified as a component of our job descriptions...some recycling bins were available but colleagues showed frequent misuse of them, even wrongly putting dangerous materials in them, causing the recycling vendor to threaten ceasing business with the organization.
Neutral Response	none
High Agreement	Sustainability is part of the culture and most of my colleagues are mindful.
CES Item	2. Because we work together, I am optimistic my organisation can improve its efforts to create a more sustainable world.
Low Agreement	My organisation is extremely profit driven and focused. Triple bottom line is not really of much importance to management. And as mentioned before senior management don't really consider input from employees.
Neutral Response	none
High Agreement	Being in the mining industry and the spotlight for promoting sustainability being on the industry, my organisation has been establishing think tanks - comprising of employees (from different backgrounds and departments), external consultants and the local communities - to identify the ability for our organisation to create shared value while placing focus on a more sustainable environment.
CES Item	3. I am confident sustainability will remain a priority for my organization in the long term
Low Agreement	...the last corporate environment I was in allocated little to no concern in respect of sustainability and corporate responsibility.
Neutral Response	none
High Agreement	Each organization I have been a member of has evinced an increasingly meaningful commitment towards effecting superior sustainability initiatives, and this seems a trend that is unlikely to suffer a back-slide.
CES Item	4. My organization has a clear vision for sustainability.

CES sample quotes	
Low Agreement	My company has no vision for sustainability that I'm aware of.
Neutral Response	Frankly, I'm not aware of any deliberate or articulated organizational policies relating to sustainability as it pertains to the social or environmental dimensions.
High Agreement	...sustainability is an explicit organisational goal.
CES Item	5. My colleagues have a strong commitment to making this organization more sustainable
Low Agreement	This topic has never been broached in my organisation.
Neutral Response	I am not sure.
High Agreement	They are constantly evolving their sustainability measures and are constantly looking for ways to improve our current practices.
CES Item	6. People in my company are able to successfully address difficult and complex sustainability issues.
Low Agreement	People at my organisation still have a rudimentary attitude toward business, so sustainability, other than the actual business and financial sustainability is outside their scope of concern.
Neutral Response	I have not come across a forum where these issues are discussed and considered
High Agreement	none
CES Item	7. Even if my organisation is having a tough financial year, staff still strive to make a positive impact on environment, society, legislation and good business practice challenges facing us.
Low Agreement	When things get tough financially at my organisation it purely focuses on costs. Unfortunately everything gets put on the back burner when something like this happens and only direct cost saving or short term revenue gaining projects are pushed
Neutral Response	none
High Agreement	Absolutely, our organisation's operating license greatly depends on the adherence to sustainability regulations
CES Item	8. As an organisation, we strive to reach our sustainability goals even when times are tough.
Low Agreement	Sustainability goals seem to be taking second preference to more traditional financial performance measures in the short term.
Neutral Response	I have not been through tough times in the organisation.
High Agreement	The organisation I previously worked for was a mining company and it had a strong drive for sustainability and all the associated activities that go along with "sustainability"
CES Item	9. By working together my organisation can be a sustainability leader in our industry.

CES sample quotes	
Low Agreement	We are a tiny player in the industry and would have little to no effect on the big players.
Neutral Response	none
High Agreement	My organisation is a large multinational petrochemical company and can directly influence the sustainability in our industry.

### Scale refinement

By analysing the content of free-form answers and score to quote alignment I was able to identify which items were answered more consistently and were therefore, by implication, stronger than others in clarity and simplicity. Using these insights I selected items for a reduced 10-item survey. Table 3.31 below lays out and explains the possible eliminations and amendments of Phase 5 scale items.

Table 3.33 Phase 5 SES items and post-test modifications

#	Scale	Item Tested	Amendment rationale	Post-test amended item
1	SES	I am confident that I can change the way I work so that my organisation is more sustainable.	None: good understanding and answer consistency from respondents	I am confident that I can change the way I work so that my organisation is more sustainable.
2	SES	I am confident that I can make changes to the way that I work which will support my organisation's sustainability goals.	Possible elimination: respondents may lack of knowledge regarding organisational goals	
3	SES	I am confident that I can be a part of making this organisation more sustainable.	None: good understanding and answer consistency from respondents	I am confident that I can be a part of making this organisation more sustainable.
4	SES	I am confident that in making decisions at work, I am able to take into account the environment, society, legislation and good business practice.	Possible elimination: multiple concepts make answering more difficult	

#	Scale	Item Tested	Amendment rationale	Post-test amended item
5	SES	I am confident that I can make suggestions to my colleagues on ways they can be more sustainable at work.	None: good understanding and answer consistency from respondents	I am confident that I can make suggestions to my colleagues on ways they can be more sustainable at work.
6	SES	I am confident that I can explain how sustainability relates to my own work.	Possible elimination: in interests of brevity and essentially covered by item SES1	
7	SES	I am confident that I can remain positive about supporting my organisation's sustainability goals.	Wording amended from "sustainability goals" to "sustainability" as respondents may not have knowledge of formalised goals/ organisation may not have formalised goals at all	I am confident that I can remain positive about working towards my organisations sustainability
8	SES	Even in the face of challenges, I can still do my work in a way that supports my organisation's sustainability goals.	Possible elimination: respondents may lack of knowledge regarding organisational sustainability goals	
9	SES	Even when others do not support me in my sustainability efforts, I still persevere.	None: good understanding and answer consistency from respondents	Even when others do not support me in my sustainability efforts, I still persevere.

Table 3.34 Phase 5 CES items and post-test modifications

#	Scale	Item Tested	Amendment rationale	Post-test amended item
1	CES	People in my company are able to successfully address difficult and complex sustainability issues.	Possible elimination: respondents professed to not being exposed to this much so could not answer; limited knowledge of broader staff initiatives	
2	CES	Because we work together, I am optimistic my organisation can improve its impact on creating a more sustainable environment.	Amended: 'environment' change to 'world' so as to limit potential confusion regarding the natural environment versus the broader context.	Because we work together, I am optimistic my organisation can improve its efforts to create a more sustainable world.

#	Scale	Item Tested	Amendment rationale	Post-test amended item
3	CES	By working together my organisation can be a sustainability leader in our industry.	Possible elimination: some respondents questioned whether "working together" was enough to get an organisation to sustainability leader; there was also some confusion as to "who" they would be working together with? Our intention related to colleagues, but some respondents referred to broader societal actors, such as governments.	
4	CES	As an organisation, we strive to reach our sustainability goals even when times are tough.	Possible elimination: respondents may lack of knowledge regarding organisational sustainability goals	
5	CES	Even if my organisation is having a tough financial year, staff still strive to make a positive impact on environment, society, legislation and good business practice challenges facing us.	Issues of multiple concepts: mixing the voluntary (enviro/social) with regulated (legislation) AND good bus practice is a multiple mix and was not easy to answer. Some respondents were daunted by the terminology especially 'legislation'. Not all respondents had experienced 'tough financial years'. Amended: multiple concepts collapsed into 'sustainability'; made the negative aspect of a 'tough financial year' into a positive aspect of 'remain a priority for the long term'; brought in elements of resilience, but not limited to a 'tough financial year'.	I am confident sustainability will remain a priority for my company in the long term
6	CES	When financial and human resources are limited, sustainability stays a priority for this organisation.	Possible elimination: Covered essentially by amended item CES 5. Combined concept of financial AND human resources complicate item; not all respondents understood the 'human resources' concept.	

#	Scale	Item Tested	Amendment rationale	Post-test amended item
7	CES	My organisation has a strong vision for sustainability.	Amended: Changed the word 'strong' to 'clear' vision as the communication around the vision is the important factor, rather than it being strong or weak. Clear means that it is easily understood.	My organisation has a clear vision for sustainability.
8	CES	The staff in my organisation have a strong commitment to making this organisation more sustainable.	Amended: wording was changed from "staff" to "my colleagues" to narrow the sphere of employees referred to. In large companies it is difficult for respondents to know about and thus state an opinion on all staff and their capabilities in the organisation.	My colleagues have a strong commitment to making this organisation more sustainable.
9	CES	The staff in my organisation know what needs to be done to make this organisation more sustainable.	Amended: 'Staff' changed to 'my colleagues' to narrow the group of employees. In large companies respondents will not know about the capabilities of distant staff. 'Know what needs to be done' was changed to 'have the right capabilities' as was considered more elegant terminology; 'know' is not as useful as 'Knowledge & Choice' or 'possession of capabilities'. Item prefaced with "If they choose to do so" to bring in the element of volition, as some respondents said colleagues might have the knowledge, <i>but didn't care to act on it.</i>	If they chose to do so, I am confident my colleagues have the right capabilities to make this organisation more sustainable.

### 3.2 Final Scales and their Application

As a result of the five development and validation phases, the final scales are presented in Table 3.32 below. I include the full 18 item set (9 SES, 9 CES) and a shorter 10 item set (5 SES, 5 CES) highlighted in blue. Although users may prefer the shorter 10 item set, the full 18 item set provides more detail, and despite the 10 item set having gone through

an additional stage of analysis, the 18 item set still holds a high standard of rigour in its development and validation.

Table 3.35 Final SES Scale

SES Scale Items
1. I am confident that I can change the way I work so that my organisation is more sustainable.
2. I am confident that I can be a part of making this organisation more sustainable.
3. I am confident that I can make suggestions to my colleagues on ways they can be more sustainable at work.
4. I am confident that I can remain positive about working towards my organisation's sustainability.
5. Even when others do not support me in my sustainability efforts, I still persevere.
6. I am confident that I can make changes to the way that I work which will support my organisation's sustainability goals.
7. I am confident that in making decisions at work, I am able to take into account the environment, society, legislation and good business practice.
8. I am confident that I can explain how sustainability relates to my own work.
9. Even in the face of challenges, I can still do my work in a way that supports my organisation's sustainability goals.

Table 3.36 Final CES Scale

CES Scale Items
1. Because we work together, I am optimistic my organisation can improve its efforts to create a more sustainable world.
2. I am confident sustainability will remain a priority for my organisation in the long term
3. My organisation has a clear vision for sustainability.
4. My colleagues have a strong commitment to making this organisation more sustainable
5. If they chose to do so, I am confident my colleagues have the right capabilities to make this organisation more sustainable
6. People in my company are able to successfully address difficult and complex sustainability issues.
7. By working together my organisation can be a sustainability leader in our industry.
8. As an organisation, we strive to reach our sustainability goals even when times are tough.

### CES Scale Items

9. Even if my organisation is having a tough financial year, staff still strive to make a positive impact on environment, society, legislation and good business practice challenges facing us.

Chapter 3 detailed the processes involved in generating the constructs of SES and CES, and the items for both scales. Statistical validation processes were followed, resulting in a set of scales that will assess employees' propensity to engage in sustainability behaviours and that are generalizable enough to be applied across departments, employee levels and industries. Having now arrived at a set of tested scales my curiosity went beyond merely measuring SES and CES, and extended to wondering what could be behind the results? I was curious about the aspects in the external environment, and an individual's internal environment that were at play when assessing their SES and CES. This led to the next phase of the research which was an exploration into theorising a model for the antecedents of SES and CES.

## **CHAPTER 4: EXPLORATION OF THE ANTECEDENTS OF SES AND CES**

In this chapter, I address my second research question: 'what are the judgement factors that lead to SES and CES?' This is in response to a call from the literature for more research into the drivers of employee engagement in pro-sustainability behaviours in organisational settings (Lo et al., 2012). This question was motivated by a desire to expand understanding of the particular *conditions* that impact the formation of SES and CES assessments. Identifying these key conditions provides valuable information to researchers and practitioners on key levers for building efficacy for sustainability in the workplace. In the following sections, I describe my approach and methodology used to answer this question, and I describe and discuss the resulting model.

### **4.1 Approach**

The core factors for SES and CES were derived in Section 3.1.2. SES is composed of four factors (Capacity, Understanding, Resilience, and Positive Outlook). CES is composed of three factors (Collaboration, Vision, and Resilience). In this chapter, my interest is in understanding what informs employees' formation of their efficacy judgments with respect to each of these factors. Efficacy judgements are an individual's consideration of personal and situational conditions, and tasks, which impact their assessment of SES or CES. To theorise on these possible antecedents of SES and CES, I conducted a qualitative, inductive study exploring survey respondents' explanations of what motivated them to select their scores for particular items on the SES and CES scales. Using a configurational approach, I then sought to connect respondents' SES and CES scores with the dimensions of possible antecedents.

I elected to pursue this phase of the study qualitatively, as a model of antecedents ought to be developed carefully prior to quantitative testing. (Recommendations to test this model quantitatively are included in the section on future research.) The existing literature provided only partial insights into what such a model might look like. Additionally, Miles &

Huberman, (1994) recommend using data display as an analytical tool, arguing that the developmental interaction between display and analytical text enables the researcher to summarise data, identify themes, patterns and clusters, uncover relationships and develop explanations. Analysis carried out through concept coding, (manually or by computer software), is also suited to conceptual modelling (Briggs, 2007). My study made use of available quantitative and qualitative data to analyse and then develop this preliminary model. This approach was also taken within the context of my study’s overall scope, which included significant work on the scale development.

This section was done in five key phases, which were undertaken concurrently for both SES and CES. After the first phase of collecting data from the surveys and interviews, I identified a set of possible antecedents for both SES and CES by coding respondents’ comments about what motivated how they answered particular items.

In the fourth phase, I made use of data display tables such as those outlined by Miles and Huberman (1994) to allow for a configurational analysis comparing the occurrence of antecedents and respondents’ scores for SES and CES. Table 4.1 represents the format of this approach. Finally, based on the patterns recognised in these tables, I theorised models of the antecedents of SES and CES. Each of these phases is described in more detail below.

Table 4.1 Approach to antecedent exploration

		Strong SES/CES Score ↓			Moderate SES/CES Score ↓			Weak SES/CES Score ↓		
Antecedents		High	Medium	Low	High	Medium	Low	High	Medium	Low
Perceived importance	→									
	→									
	→									
	→									
	→									
	→									

## 4.2 Data collection

### Free-from survey data

In Section 3.1.5 I detailed the process of gathering free-form answers from MBA respondents. My objective in gathering and analysing the free-from answers was to gain insight into respondents' thought process, or what influenced their judgements in answering the items. To facilitate this analysis, I divided an 18-item survey into six separate surveys containing three items each, with a free-form space after each item asking: "Can you please explain why you rated this question as you did?" In total I received 76 completed surveys with qualitative content on respondents' reasons for scoring items as they had.

### Interview design

Over and above the 76 free-form responses gathered in Phase 5 of the scale development, I believed that one-on-one discussions, only possible in an interview process, would gather richer data on the judgements respondents had made in completing their survey answers. I thus interviewed ten employees from Finco, as well as four MBA students, all of whom had previously responded to the survey. These interviews were about thirty minutes long and structured by an interview protocol. Appendix K provides the full list of interview questions, including the rationale for their inclusion. Interviews were recorded and transcribed with interviewees' permission.

To start, I asked a few opening questions to put the interviewee at ease and glean information about their work roles and any personal interest they might have in sustainability. These included questions such as Q.2: "Can you tell me what you understand about sustainability, particularly in your work context?" Based on their answers regarding their level of knowledge of the subject, I modified how I engaged with respondents during the interviews.

I then focused on drawing out descriptions of the judgements interviewees had made in their SES and CES assessments. To do so I asked interviewees why they had scored a particular item as they had. This was intended to draw out details of the influences affecting respondents' judgements in assessing their ability to perform the task mentioned in each of these items. As each item was related to a particular factor, these answers provided indications as to what was influencing judgements that were being made for each factor.

Because cognitive appraisal of past experiences, current personal and situational conditions and task assessment are intrinsic in the formation of efficacy judgements (Gist & Mitchell, 1992), I also included interview questions to draw out more specific references to these aspects which might impact efficacy assessments. Personal factor questions referred to, *inter alia*, perceptions of control, skills, and feelings about sustainability. For instance, Q.31: "What knowledge / skills do you think you would need to be able to answer these questions 'strongly agree?'" I intended for this question to draw out details relating to personal capability gaps the interviewee might feel prevented them integrating sustainability into their everyday work behaviours, such as requisite knowledge, or methods of integrating sustainability in the workplace. Situational factor questions referred to the work environment, intervention by managers, and quality of organisational communications. For instance Q.22: "What about your work environment makes these [sustainability integration] tasks easier for you?" This question was based on the idea that supportive environments build efficacy and unsupportive ones weaken efficacy (e.g. Oreg, Bartunek, Lee, & Do, 2016). I hoped to draw out respondents' assessment of the level of support they received for integrating sustainability within their organisations. As an example of a task-related enquiry Q.20 asked: "When you think about the task of [insert action from a survey item], what goes through your mind?" My intention here was to draw out how interviewees judged the sustainability tasks themselves. As noted previously a full list of interviewee questions with their rationale for inclusion is in Appendix K.

### Sampling and interview process

I had identified that the most valuable pool of potential interviewees would come from Finco, where I had the largest group of survey respondents from a single organisation. To identify potential Finco interviewees, I selected from among a subset of 657 survey respondents from departments in the core business function (124 respondents from four specialist departments were excluded in response to a request by management). In an attempt to recruit respondents with a range of SES and CES scores, I grouped the respondents into high (4.68 - 7.00), medium (2.34 - 4.67), and low (0-2.33) SES and CES (combined scores). Since there were only three low scoring respondents, they were all selected to be part of the sample. I created two separate lists for medium and high scoring respondents. I applied a Microsoft Excel randomiser to each list. I selected the first 29 high and eight medium scoring respondents, based on the proportion of high to medium answers in the total selection. I eliminated apparent straight-liners and extended my selection to replace these. I settled on a total of 40 respondents for the first round of interview selection, including high, medium and low scoring respondents.

I provided the selected employee numbers to Finco's Sustainability Manager who matched the numbers to the individual's email addresses and then emailed the interview invites. A covering email explained why their input was required, how they were selected, and how the interview process would proceed, and it reaffirmed confidentiality of interviews (Appendix J). Of the initial set invited, 13 no longer worked at Finco, had unattended mailboxes, or were on leave during the interview period. I repeated the selection process twice as the number of initial volunteers for interviews was low (only four confirmed). The list was extended by 30 (three confirmed) and then a further 28 more (five confirmed). In total, 12 Finco respondents confirmed interviews.

I then endeavoured to further supplement my data set with interviews with modular MBA respondents. I considered these modular students an appropriate population for the

purpose of this analysis as they were currently, or had recently been, employed and thus had recent experience of organisational working environments. Most answered the questions in light of their current roles, or their last work experience if not currently employed. I had invited MBA survey respondents to leave their contact details if they were willing to be interviewed. After contacting those who had left their details, four interviews were confirmed. Table 4.2 below details the position and sector for the MBA interviewees.

Table 4.2 MBA Interview credentials

Interviewee	Role	Sector
MBA Interviewee 1	Head of Operations and Statutory Accounting	Mining
MBA Interviewee 2	Team Leader	Finance
MBA Interviewee 3	Team Leader	Education
MBA Interviewee 4	Vice President	Investment Banking

I conducted the interviews either in person or over the telephone, providing interviewees with a copy of their survey responses to serve as a reminder of their survey responses. Interviews were recorded only after requesting express permission and, to preserve anonymity during recording, I used a unique identifier code instead of the individual's name. I followed the pre-developed set of questions, but also engaged in the natural flow of the conversation. On completion, I made field notes and sent an email thanking the interviewee for their participation. Unfortunately due to some cancellations, only ten of the twelve committed Finco interviews were finalised.

After downloading the interview recordings, I transcribed the more difficult ones such as those with colloquial accents. I sent the others to a transcription service provider. On their return, I checked the completed transcripts and filled in gaps or adjusted incorrectly interpreted words. The transcripts totaled 136 pages of text. Thereafter, I uploaded the

transcripts and survey responses to qualitative data analysis software (Atlas.ti) to support my coding process.

### **4.3 Identifying possible antecedents**

I had 74 free-form answers, gathered during Phase 5 of the survey validation process, supplemented with fourteen useful transcripts from interviews with Finco and MBA respondents, to use in the coding process. I had a particular interest in coding for the experiences that helped shape their judgements of their capability to perform the sustainability integration behaviours enquired about in the survey items. Each item in the survey, and many of the interview questions, related to a specific SES or CES factor. By examining the free-form survey responses and interview data, I identified short phrases or sentences which might indicate what appraisals of past experiences, personal and situational conditions, and tasks assessments were influencing the judgements of respondents in assessing SES and CES. I iterated throughout the coding process: creating and renaming codes, and recoding and grouping quotes to enhance my understanding of the data and ensure consistency.

Next I sought to identify the prevalent codes for each factor. To assist with this analysis, I used the coded data to generate detailed data tables as recommended by Miles and Huberman (1994), and retaining extensive sample quotes (see Tables 4.7 and 4.8). I created a table listing survey items, grouped into their related SES factors of Capacity, Understanding, Resilience and Positive Outlook; and into related CES factors of Collaboration, Vision and Resilience. I recorded the number of mentions of a specific code for each item. On completion of this process, I was able to identify the most prevalent codes for each of the items.

I then added up the number of mentions of each possible antecedent for all items that pertained to a specific factor to arrive at the total number of possible antecedent mentions

per factor. See Tables 4.3 and 4.4 below. There were a few antecedents which appeared numerous times for more than one factor, which I discuss further in Section 4.6

Table 4.3 Possible Antecedents for each SES factor

SES Factor	Possible Antecedents	# of Mentions
Capacity	General personal influence	15
	Role relevance	15
	Control	9
	Role influence	5
Resilience	Personal values	12
	Personal commitment to sustainability	11
Understanding	Knowledge of sustainability	8
	General personal influence	6
	Sustainability work experience	5
Positive Outlook*	Knowledge of sustainability	3
	Goal clarity	3
	Sustainability is part of business strategy	2
	Sustainability work experience	1

\*Excluded from further analysis

Due to a low number of overall mentions for the factor of *Positive outlook*, this factor was excluded from further analysis. There are three possible reasons why *Positive outlook* related mentions may not have appeared prevalently. First, *Positive outlook* may not be important in giving rise to SES, despite Kavanagh and Bower's (1985) more general assertions, which motivated my initial choice to include it as a factor. Second, the lack of mentions may be due to the inclusion of only one *Positive outlook* related item in the ten-item abbreviated scale (see item #4 in Section 3.2), possibly resulting in a low volume of free-form data for this factor. Lastly, respondents may also have been less comfortable in sharing emotional insights in the surveys or interviews, compared to reporting on work-

related activities. It may fall to others to explore whether *Positive outlook* is a necessary component of SES by including additional related items, expanding the sample, or conducting more in-depth interviews.

Table 4.4 Possible Antecedents for each CES factor

CES Factor	Possible Antecedents	Mentions
Collaboration	Sustainability is part of business strategy	10
	Coworkers' knowledge & skills for sustainability	8
	Coworkers' willingness for sustainability	5
	Personal knowledge of sustainability	4
Resilience	Goal clarity	2
	Commitment to CSR	2
	Sustainability is part of business strategy	7
	Coworkers' knowledge & skills for sustainability	1
Vision	Structures to ensure sustainability	4
	Communications for sustainability	3
	Goal clarity	7
	Coworkers' knowledge & skills for sustainability	1

During the coding process I had defined all codes as they originated. Having now identified particular codes as possible antecedents, I draw out and provide their definitions in Tables 4.5 and 4.6 below.

Table 4.5 SES Possible Antecedents defined

Possible Antecedents: SES	Definitions
Role influence	An individual's perception of the degree to which their functional role influences their workgroup's sustainability behaviours.
General personal influence	An individual's perception of their ability to shift a co-workers' behaviours towards sustainability.
Role relevance	An individual's perception of the degree to which their role includes responsibility to contribute to the organisation's sustainability objectives.
Personal commitment to Sustainability	An individual's perception of the degree to which they voluntarily take on and fulfil obligations related to sustainability integration behaviours.
Control	An individual's perception of the degree to which they have control over their work and related processes.
Personal values	An individual's perception of the degree to which sustainability integration behaviours are aligned with their personal values.
Knowledge of sustainability	An individual's perception of the degree to which are informed and familiar with the principles of sustainability and their application.

Table 4.6 CES Possible Antecedents defined

Possible Antecedents CES	Definitions
Sustainability is part of business strategy	An individual's perception of the degree to which sustainability is integrated into their organisation's business strategy.
Goal clarity	An individual's perception of the degree to which their organisation expresses well-defined goals with respect to its sustainability vision.
Co-workers' sustainability knowledge and skills	An individual's perception of the degree to which co-workers are informed and familiar with the principles of sustainability and their application to enable the group to succeed in achieving their sustainability goals.
Co-workers' willingness for sustainability	An individual's perception of the degree to which their co-workers show a receptive and positive attitude towards integrating sustainability into their everyday workplace behaviours.

I theoretically discuss why these might be the antecedents of SES and CES in depth in Section 4.6

#### 4.4 Dimensionalising antecedents

In the prior section, I identified possible antecedents pertaining to each factor for SES and CES. In this section, I describe how I dimensionalised these antecedents according to their relative perceived importance to respondents (high, medium and low).

To serve as predictors in my theoretical development, I needed to confirm whether these possible antecedents aligned with SES and CES scores. To do so, I undertook additional coding to enable grouping of these antecedents according to the level of perceived importance they held for respondents. As an example, the following quotes demonstrate how I dimensionalised the possible antecedent of *Role influence*. High *Role influence* is illustrated by the following interview quote: **Across my career, I have been in roles where I have had some level of decision-making ability, which has increased as I progressed within organisations.** I interpreted this response as their perception that they had increasing levels of influence due to their role. An example of medium influence is illustrated by a survey respondent's explanation of the survey item: **"I'm confident I can be part of making this organisation more sustainable": If I was in senior management. So I'm a middle manager, which is quite a difficult in-between space to be in. I think if I was in senior management and was invested enough, then absolutely.** I interpreted this as medium *Role influence* as they appear to perceive that they would be in a better position to contribute if they held a more senior role. Finally, the comment: **I am also not in a particularly important or influential decision making position and as such my influence is limited** illustrates low role influence, evidenced clearly by the declaration of their perception of their limited influence.

I provide further representative quotes in Tables 4.7 (SES) and 4.8 (CES) below.

Table 4.7 Representative quotes for SES antecedents

Antecedent perceived importance	General personal influence
High	So even if I am in a fairly junior role, there are still choices I can make on a day-to-day basis that can support an organisation being more sustainable (i.e. turning off lights in rooms where no one is working).
	I feel confident I am empowered to influence the strategic direction of my organisation including sustainability.
	I am a decision maker in my organisation.
Medium	Though there are set procedures to do things at work there have been incremental changes that have happened with my contribution so if I can change the way I work I could influence some things.
	I am in a position to make key decisions in my organisation. I do however, believe that there is a threshold as to how sustainable I can make the organisation.
	I am in a management position, so to some degree, I can influence business practice at my organisation.
Low	I am confident, but [...] those responsible for the implementation of those practices are essentially beyond my jurisdiction.
	...even though I may feel comfortable enough to make suggestions, I believe that they would not actually be heard or that anything would be done about it.
	...senior management don't really consider input from employees [like me]. The organisation has a very hierarchical structure.
Antecedent perceived importance	Role influence
High	As the level of seniority grows so I am able to make more impacts with my decisions (i.e. placing more rigorous sustainability clauses within contracts being placed with suppliers).
	I am a senior member of my team so achieving this within my unit is quite plausible.
Medium	Although I'm not in a management position, I operate at a fairly senior level from a mandate point of view within the company. When I ask for things to be done, or even to go so far as to instruct things to happen, like a proper written instruction, it should carry the same weight as senior management. Sometimes it just gets ignored.
	I have medium level decision-making power.
Low	The issue here relates to my position within the company. In order to achieve these goals I need to influence others to do so. So my efforts may not translate into any outcome.

	I don't think my role would really contribute to sustainability all that much.
Antecedent perceived importance	Personal values
High	I'm also quite resilient and I would push back when I feel like I'm not being heard or if my values are not represented.
	I believe in standing up for what I believe.
	I think it's the 'right thing to do'.
	Given the ethical bearing and understanding of sustainability initiatives, there is a personal element to it anchored on values.
Medium	none
Low	none
Antecedent perceived importance	Personal commitment to sustainability
High	I will continue to do my part even without other's support.
	I'm too stubborn by half, and so it matters little whether or not I'm supported. The results may vary, but not my conviction.
	I am very committed to sustainability in my organisation.
Medium	none
Low	none
Antecedent perceived importance	Role relevance
High	I work as an environmental consultant and thus a large part of <b>my work is related to sustainability...</b>
Medium	There are aspects of my work which allow me to feel as if I am contributing to the larger sustainability goals.
	I am responsible for business improvement, and as part of our business planning and long-term strategy, we do consider various aspects of sustainability.
Low	I work in the financial sector in a role that is far removed from sustainability initiatives.
	...my role does not consider impact to communities and government so focus is more on internal processes.
	I work as a software developer, meaning I do not have many direct environmental impact assessments to make.
Antecedent perceived importance	Control

High	I've got quite a lot of autonomy in my role. My job is, I've got a small team but it's essentially become its own department. I've got a lot of autonomy to do with it what I see fit.
	Because my role didn't exist before I've got a lot of freedom to define what that looks like.
	It's my company and I make all of the decisions.
Medium	<i>none</i>
Low	Q. Do you feel like you have a lot of control over how you work? Is there quite a lot of autonomy for you to change how you do things? A. Not Really.
Antecedent perceived importance	Knowledge of sustainability
High	I am confident that I have the skills now after the MBA to be able to better communicate sustainability goals and drivers within an organisation in a way that other business leaders can understand.
	What are the key things to me? I can sum it in three "P's - people, planet and profit."
	I have relevant education and an interest in the outcome.
Medium	I think I have an idea of what sustainability means in the context of my industry but am not 100% certain.
Low	I think I would want to know more about it [sustainability]. I know that it's important and I can see that it's like mobile marketing – it's the next [...] thing.
	I also do not have a good understanding of what sustainable practice would be for the people in my organisation, and hence the appropriate actions.
	[...] when it comes to "planet," honest I can't answer that part.
Antecedent perceived importance	Sustainability work experience
High	I can see over the last five years how much have changed with respect to our sourcing practices, sustainable farming, carbon neutrality and zero waste to landfill.
	I've been dealing with sustainability issues from a compliance perspective in industry
Medium	A very small part of this in my work place is around saving water and papers which is a very narrow way of looking at it.
Low	I don't feel we are exposed to [...] sustainability. The thing is that I can't say I am [confident] as have not been in that situation or predicament.
	I have not come across a forum where these issues are discussed and considered

Table 4.8 Representative quotes for CES antecedents

Antecedent perceived importance	Sustainability is part of business strategy
Low	While we don't necessarily practise sustainability measures locally, the business model of my organisation is based on a greener technologies.
	We have a focus on the triple bottom line: People, Planet and Profit (in that order).
	As part of our business planning and long-term strategy, we do consider various aspects of sustainability.
Medium	none
Low	Currently sustainability is not a core part of the way we do business.
	[...] complex sustainability issues are not a strategic priority at all.
	Sustainability is not a key business objective
	Unfortunately production is and remains a priority in the mining industry. Cost is always a factor and new sustainability initiatives are usually seen as a nice add-on but not core to the business, or to everyone in the business and sometimes rescheduled to future years when there is budgets for "community investments".
Antecedent perceived importance	Goal clarity
High	Everyone is working towards the same overarching goals
	Working for a global social enterprise, the main goals will always be on social sustainability. Working on supply chain will be a secondary focus, but with good leadership, progress can be made on the environmental side too.
Medium	[...] it's part of the business goals. It's not clearly defined as sustainability.
Low	We have very few sustainability goals.
	I'm not really sure what our company's sustainability goals are. I'm sure we have some but it's a rather large company (+4 000 people) and if they've communicated it, it probably got lost in the mass of general information that gets sent and I failed to notice it.

Antecedent perceived importance	Co-workers willingness for sustainability
High	[...] my team will work together with me as we are adaptable according to what we see to be the best strategy to do things. This is primarily because I still have a young team who have not developed a strong unsustainable culture and do not have a strong resistance to change.
	[...] most of my colleagues are mindful [of sustainability].
Medium	I think most staff is of this mindset but there is also a considerable chunk that just gets by. Overall I believe the intention to do well is there.
	I know in our [place name] head office they're talking about kitchen waste, being able to recycle. There are programs so we recycle printer cartridges and it's slowly taking off.
Low	[...] because it is not ingrained and that is not something that everybody does. You find a lot of compostables in the rubbish and a lot of rubbish in the recyclables and little things like that [...]
Antecedent perceived importance	Co-workers' sustainability knowledge and skills
High	My answer would be 'strongly agree', and I base that on the skill, interest, and dedication towards recognising opportunities for improvement and contributing towards solutions.
	They are more than capable.
Medium	I feel that we will be able to create a more sustainable environment, however, I am not sure if everyone is aware what sustainability really is.
Low	[...] employees have no idea what it [sustainability] even means.

#### 4.5 Configurational analysis

In this section, I describe how I compared the perceived relative importance of possible antecedents to the SES or CES scores of the respondents to assess whether the level of importance of possible antecedents appeared to align with stronger or weaker SES or CES scores.

First, I listed the possible antecedents for either SES or CES in the table rows. Second, I took the SES or CES scores of the respondents that mentioned each antecedent and I averaged their SES or CES item scores. This step was necessary because I did not have a complete set of survey responses for all respondents. I grouped respondents with an average score of six or seven (mostly Agree or Strongly Agree answers) into the category of strong SES or CES; those with average scores of three to five (mostly Somewhat Disagree to Somewhat Agree answers) as moderate; and those with average scores of one or two (mostly Completely Disagree and Disagree answers) as weak.

Third, I created three columns for strong, medium and weak SES or CES scores in the tables, which I further subdivided by varying levels of antecedent importance (high, medium and low). Next, I populated Tables 4.9 (SES) and 4.10 (CES) with the frequency of occurrence of codes in each category. I was able to do this by tracing each quote back to a particular respondent and noting their SES or CES score range alongside the quote. For example, a quote reflecting high importance for the antecedent *General personal influence*: **I feel confident I am empowered to influence the strategic direction of my organisation including sustainability**, originated from a respondent with a strong sense of SES. This mention was thus recorded in the strong SES range and high importance column, in the cell aligned with the antecedent *General personal influence*. Table 4.9 below depicts the outcomes of the configurational analysis for SES.

Table 4.9 Antecedents configured against SES scores

Antecedent	STRONG SES			MODERATE SES			WEAK SES		
	H	M	L	H	M	L	H	M	L
Perceived importance →									
Knowledge of sustainability	9	5	1	1	3	1	0	0	1
Role influence	7	3	2	0	0	4	0	0	0
Sustainability work experience	11	2	0	1	1	1	0	0	0
General personal influence	6	4	0	0	2	3	0	0	0
Role relevance	5	1	2	0	1	3	0	0	0
Control	9	0	1	1	0	0	0	0	0
Personal commitment to sustainability	11	0	0	0	0	0	0	0	0
Personal values	9	0	0	1	0	0	0	0	0

As can be observed above, in general for a given antecedent, respondents with a strong sense of SES were more likely to also note high or medium support for that antecedent, and respondents with a moderate sense of SES were more likely to note medium or low support for that antecedent. It must be noted that I had limited qualitative data from respondents with a weak SES score (scoring between one and two), thus only one instance of a code appears in this part of the table, with that respondent citing weak knowledge of sustainability. I discuss the detailed results for individual antecedents, including deviations from these patterns in more detail in Section 4.6 below. Table 4.10 below depicts the outcomes of the configurational analysis for CES.

Table 4.10 Antecedents configured against CES scores

Antecedent	STRONG CES			MODERATE CES			WEAK CES		
	H	M	L	H	M	L	H	M	L
Perceived importance →	H	M	L	H	M	L	H	M	L
Sustainability is part of business strategy	6	0	0	1	0	10	0	0	4
Goal clarity	6	0	0	0	1	4	0	1	1
Co-workers' willingness for sustainability	2	1	1	1	1	4	0	0	0
Co-workers' sustainability knowledge and skills	1	0	2	2	1	3	0	0	2

Again high antecedent importance pooled in the strong CES score range, with the anomalies of three mentions of low antecedent importance appearing in this range. These are addressed in Section 4.6.2 below. Low antecedent importance, (especially for *Sustainability is part of business strategy*), pooled in moderate CES and, as expected, under weak CES.

#### 4.6 Theorising the relationships between antecedents, factors and SES or CES

In this section, I theorise the relationships between the antecedents, their related factors, and SES or CES. I structure this section by factor, then by related antecedents, discussing definitions, configurational patterns, and the relationships between antecedents and their factors and SES or CES.

##### 4.6.1 SES antecedents

Figure 4.1 outlines my proposed model of the antecedents of Self-Efficacy for Sustainability (SES). I propose that SES is influenced by three core factors (Capacity, Understanding, and Resilience), each with an associated set of key judgement elements. Depending on the relative perceived importance of the judgement factors (high, medium or low), this

will either strengthen or weaken an individual's judgement of their Capacity, Understanding or Resilience, and therefore SES. Mastery, Vicarious experience, Social Persuasion and Affective state are included in the model as they are the core experiences that build efficacy, and the model would be incomplete without them. However, even though these experiences are critically important in the formation of efficacy, it is the individual's cognitive appraisal and integration of these experiences that ultimately affect self-efficacy (Bandura, 1982). Based on this idea the builders are not the focus of this study. The focus is rather on the assessments of personal and situational conditions and tasks that impact individuals' efficacy judgements (i.e. cognitive appraisal and integration).

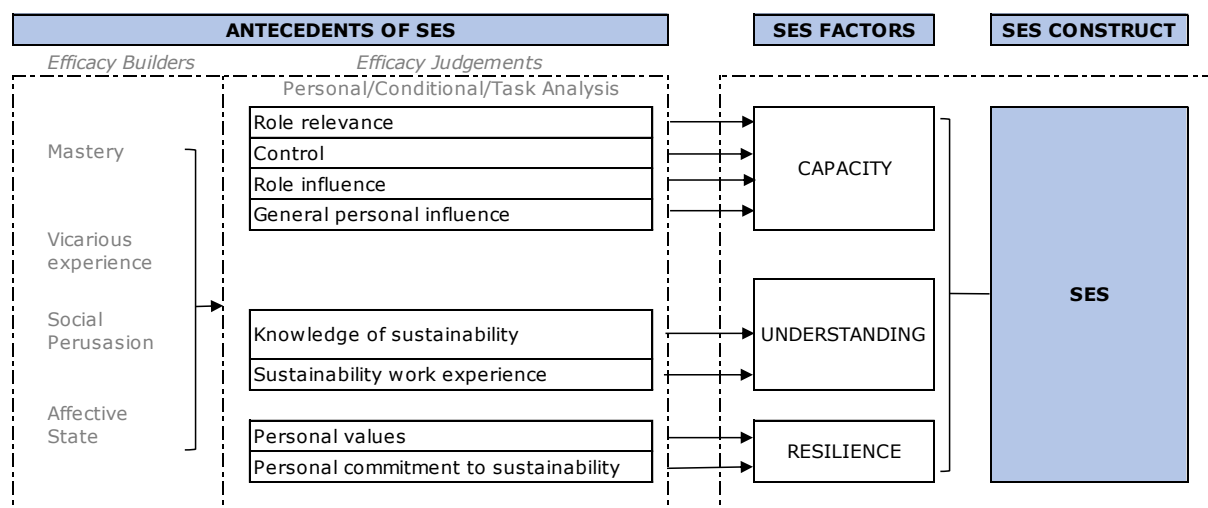


Fig. 4.1 Proposed model of antecedents of Self-Efficacy for Sustainability (SES)

In Chapter 3, I described the exploratory and confirmatory factor analysis of the SES survey items which revealed the viability of the factors of Capacity, Understanding, Resilience and Positive outlook for the SES construct. As explained previously, the factor Positive outlook is excluded from my model, as the data were insufficient. My qualitative analysis involved mapping prevalent antecedents associated with specific survey items – and therefore factors – and confirming their relevance with regard to respondents' overall SES and CES scores. This process identified the key antecedents as follows:

- Capacity has four key antecedents: Role relevance, Control, General Personal Influence, and Role Influence.
- Understanding has two key antecedents: Knowledge of Sustainability, and Sustainability work experience.
- Resilience has two key antecedents: Personal Values and Personal Commitment to Sustainability.

Next, I describe these key antecedents and the reasons for their prioritisation, grouped by their related factors.

### **SES Factor: Capacity**

As explained in Chapter 3, Capacity is an individual's perception of their ability to make changes to their everyday work that contributes to increasing their organisation's sustainability. Respondents most frequently referenced the following antecedents as giving rise to their judgement of Capacity: *General personal influence*, *Role relevance*, *Control* and, to a lesser extent, *Role influence*.

#### Capacity (SES) - General personal influence

I define *General personal influence* as an individual's perception of the relevant strength of their ability to shift a co-workers' behaviours towards sustainability. This influence does not arise from the employee's role or position in the organisation (see *Role influence*), but rather relates to an individual's own personal influence on those around them resulting from their personal credibility and/or demeanour. Table 4.11 summarises the number of mentions of this antecedent. It shows that respondents with strong SES referenced either high or medium *General personal influence*. Whereas, respondents that scored in the moderate SES range referenced medium and low antecedent importance. None of the respondents with weak SES referred to this antecedent

Table 4.11 Distribution of coding for General personal influence

	STRONG SES			MODERATE SES			WEAK SES		
	H	M	L	H	M	L	H	M	L
Antecedent perceived importance →									
General personal influence	6	4	0	0	2	3	0	0	0

While the literature has not previously referenced personal influence in relation to efficacy, it stands to reason that this antecedent may influence an employee's perception of their capacity, and thus their judgement of their own SES, because an employee with little influence may feel powerless to change their organisational context. Without some influence, even changes initiated by an employee related to their own role may be perceived as difficult to sustain if they are resisted by others, such as a line manager. An employee's perception of capacity is thus likely to be strengthened when they perceive that they are able to influence others to agree to and execute pro-sustainability changes.

#### Capacity (SES) – Role relevance

I define *Role relevance* as an individual's perception of the degree to which their role includes responsibility to contribute to the organisation's sustainability objectives. Table 4.12 reveals that respondents with a strong sense of SES tended to reference high *Role relevance*. Whereas, respondents that scored in the moderate SES range tended to reference medium or low *Role relevance*. None of the respondents with weak SES referred to this antecedent.

Table 4.12 Distribution of coding for Role relevance

	STRONG SES			MODERATE SES			WEAK SES		
	H	M	L	H	M	L	H	M	L
Antecedent perceived importance →									
Perception of Role relevance	5	1	2	0	1	3	0	0	0

There were two instances where respondents who scored in the strong SES range cited weak *Role relevance*, yet these did not undermine the relationship between this antecedent and the Capacity factor. In one of these instances a respondent appeared to have exposure to environmentally-related aspects their role, but not other aspects of sustainability, noting: [...] **the reason I have not answered strongly agree is that my role does not consider impact to communities and government so focus is more on internal processes.** From this comment it appears they were judging themselves against a broader understanding of sustainability.

While I have not identified the literature referencing role relevance, it stands to reason that an individual, whose role concerns sustainability, or integrates sustainability objectives, is likely to feel more capable in enacting sustainability-related tasks, as they spend time and effort on enacting these behaviours during their working day. Individuals form judgements of their ability partly on the basis of their past experiences of the subject in relation to their role. It stands to reason that the more that sustainability is related to an employee's role, the more front of mind, and legitimised for action, it would be. As one strong SES imbued employee noted: **It's the nature of my work [...] I can lift my head and look at the stuff that's actually also important.** Additionally, when leaders and managers designate specific roles and responsibilities for sustainability this increases attention for the issues and legitimises action (Holton, Glass, & Price, 2010; Lee, 2009; Smith & Brown, 2003). This increased focus and legitimisation in particular supports an individual to make changes.

### Capacity (SES) - Control

I define *Control* as an individual's perception of the degree to which they have control over their work and related processes. This should not be confused with the motivational theory of Locus of Control (see Section 2.3.2) which refers to a generalised orientation of control. This antecedent Control relates specifically to an employee's work processes. The table illustrates that the majority of respondents with a strong sense of SES also referenced high importance of having control over their work. None of the respondents with moderate or weak SES referred to this antecedent.

Table 4.13 Distribution of coding for *Control*

	STRONG SES			MODERATE SES			WEAK SES		
Antecedent perceived importance →	H	M	L	H	M	L	H	M	L
Control	9	0	1	1	0	0	0	0	0

Wood and Bandura have previously noted the importance of control saying, "to be successful, one not only must possess the required skills, but also a resilient self-belief in one's capabilities to *exercise control* over events to accomplish desired goals" (1989, emphasis added). It stands to reason that having control over their work allows an employee to take decisions, make the rules, and put new processes in place and therefore more likely to perceive they are capable of succeeding at implementing sustainability-related changes. This in turn strengthens overall SES. A respondent with a strong sense of SES commented: **I am in control of my own budget and can apply this in a way that will allow me to achieve the [sustainability] goals** – thus referencing control over important aspects of their work (their budget) and a freedom to apply this in the interests of sustainability.

### Capacity (SES) - Role influence

I define *Role influence* as an individual's perception of the degree to which their functional role influences their workgroup's sustainability behaviours. I elected to disentangle the antecedent of *Role influence* from *General personal influence* due to explicit references to role and position. For example: **I am also not in a particularly important or influential decision-making position and as such my influence is limited** refers to role, whereas this quote: [...] **even though I may feel comfortable enough to make suggestions, I believe that they would not actually be heard or that anything would be done about it** infers a perception of a lack of general personal influence. The table reveals that respondents with strong SES tended to reference high or medium *Role influence*. Whereas, respondents with moderate SES scores referenced low *Role influence*. None of the respondents with weak SES referred to this antecedent.

Table 4.14 Distribution of coding for *Role influence*

	STRONG SES			MODERATE SES			WEAK SES		
Antecedent perceived importance →	H	M	L	H	M	L	H	M	L
Role influence	7	3	2	0	0	4	0	0	0

Analysis of the two quotes indicating low *Role influence*, despite strong SES, showed that these do not contradict the overall viability of this antecedent. In one instance, for example, the respondent noted constraints to his *Role influence* imposed by investors, but later highlighted his ability to make changes due to his leadership role.

It stands to reason that a senior role enhances employees' belief in their capacity for sustainability due to the hierarchical 'chain-of-command' in most organisations whereby they are mandated to make changes due to position. As noted in the literature, senior managers and board members can be particularly effective [sustainability] champions due to their positions and influence (Harris & Crane, 2002).

## SES Factor: Understanding

As explained in Chapter 3, I define the factor of Understanding as an individual's perception of their level of understanding of how to apply sustainability to their own and others' work. Respondents most frequently referenced the following antecedents as influencing their judgements of Understanding: *Knowledge of sustainability* and *Sustainability work experience*.

### Understanding (SES) - Knowledge of sustainability

I define *Knowledge of sustainability* as an individual's perception of the degree to which they are informed and familiar with the principles of sustainability and their application. The table illustrates that respondents with a strong sense of SES tended to reference high and medium knowledge of sustainability. Similarly those with moderate SES tended to reference medium knowledge of sustainability. The respondent who scored weak SES referenced low knowledge of sustainability. The one instance of low knowledge in the strong SES range was related to the respondent professing an incomplete knowledge of sustainability beyond the 'green' aspects; the one item included the terms "[legislation and good business practice](#)" which they found difficult.

Table 4.15 Distribution of coding for Knowledge of sustainability

	STRONG SES			MODERATE SES			WEAK SES		
Antecedent perceived importance →	H	M	L	H	M	L	H	M	L
Knowledge of sustainability	9	5	1	1	3	1	0	0	1

Gifford & Nilsson (2014) note that an individual is unlikely to be concerned about the environment, or purposefully act in pro-environmental ways, if they know nothing about the problem or potential positive actions. In fact, knowing about the problems and potential positive actions were among the strongest predictors of responsible

environmental behaviour in Hines, Hungerford and Tomera's (1986-87) classic meta-analysis of 315 studies. It stands to reason that knowledge of sustainability leads to enhanced understanding of how to apply sustainability to everyday work behaviours. As one respondent noted: [...] **the MBA program has significantly honed my 'sustainability wherewithal' toolbox.** Perhaps most significantly, Pajares (2000) notes in the efficacy literature that no amount of confidence, or self-appreciation, can produce success when the required skills and knowledge are lacking.

#### Understanding (SES) - Sustainability work experience

I define *Sustainability work experience* as an individual's perception of the degree to which they have previously enacted sustainability behaviours in the workplace. This antecedent refers to an individual's prior experience integrating pro-sustainability behaviours into their work. This antecedent should not be confused with the antecedent *Role relevance*, which refers to where a current role is formally linked to sustainability, incorporating functions to promote sustainability within the organisation. The table illustrates that respondents with strong SES scores tended to reference high sustainability work experience, with eleven instances appearing at this intersection. Respondents that scored in the moderate SES range referenced a spread of antecedent importance. None of the respondents with weak SES referred to this antecedent.

Table 4.16 Distribution of coding for Sustainability work experience

	STRONG SES			MODERATE SES			WEAK SES		
	S	M	W	S	M	W	S	M	W
Antecedent perceived importance →									
Sustainability work experience	11	2	0	1	1	1	0	0	0

It stands to reason that sustainability work experience exposes the individual to the 'what, why and how' of sustainability, thus enhancing their understanding of the topic. The

efficacy literature describes how an individual, faced with a task such as integrating sustainability, will form a judgement based (partly) on whether they have had experience of this type of task previously (Gist & Mitchell, 1992). As an example, in response to the item: “I can be part of making this company more sustainable”, a weak SES scoring interviewee responded: I don’t feel we are exposed to [...] sustainability. I can’t say I am confident as have not been in that situation or predicament. Without exposure to sustainability work, it would prove challenging to be confident about integrating this ‘mystery concept’ into one’s work.

### **SES Factor: Resilience**

As explained in Chapter 3, Resilience is an individual’s perception of their capability to recover from, or adapt to the effects of a change, and continue to make changes in everyday workplace behaviours to pursue organisational sustainability. Respondents most frequently referenced *Personal values* and *Personal commitment to sustainability* as influencing their judgements of Resilience. These antecedents appeared exclusively for the factor of Resilience.

#### Resilience (SES) - Personal values

I define *Personal values* as an individual’s perception of the degree to which sustainability integration behaviours are aligned with their personal values, their guiding principles. The table illustrates that respondents with strong SES almost exclusively referenced high importance for personal values, with only one additional reference to high personal values from a respondent who scored moderate SES. None of the respondents with weak SES referred to this antecedent.

Table 4.17 Distribution of coding for Personal values

	STRONG SES			MODERATE SES			WEAK SES		
	H	M	L	H	M	L	H	M	L
Antecedent perceived importance →									
Personal values	9	0	0	1	0	0	0	0	0

Values are 'desirable goals, varying in importance, that serve as guiding principles in people's lives' (Schwartz, 1992, p.21), and which have important implications for motivated behaviour (Brown & Kasser, 2005). On this basis it stands to reason that an individual would show greater resilience in the face of resistance when the behaviours they are attempting to integrate are aligned with the guidelines they apply to their lives as a whole. This antecedent is supported by a number of studies have shown that the more strongly individuals hold values beyond their immediate own interests, for example, self-transcendent, prosocial, altruistic or biospheric values, the more likely they are to engage in pro-environmental behaviour (De Groot & Steg, 2007; De Groot & Steg, 2008; Nordlund & Garvill, 2002). Values transcend situations (Feather, 1995; Gardner & Stern, 2002; Rokeach, 1973) thus it is reasonable to assume that an individual would bring personal pro-sustainability values to their workplace and apply them when making decisions and persevering in driving change. In fact, prior literature notes that increasingly, organisations are allowing employees to bring their personal values to work – in turn opening opportunities for the articulation and pursuit of new goals (Hart, 2005; Howard-Grenville & Hoffman, 2003). This concept is illustrated by a respondent who commented: **I will still persevere as it is an important topic to me.** I interpret the mention of perseverance as indicative of resilience, and the phrase 'it is an important topic to me' as indicative of valuing sustainability.

### Resilience (SES) - Personal commitment to sustainability

I define *Personal commitment* as an individual's perception of the degree to which they voluntarily take on and fulfil obligations related to sustainability integration behaviours.

I differentiated between seemingly similar constructs *Personal commitment to sustainability* and *Personal values* by identifying direct references to commitment such as: **I am very committed to sustainability in my organisation**, versus references to value-based ideas and beliefs such as: **right thing to do** or: **I believe in standing up for what I believe** for *Personal values*. According to King, Felin, & Whetten (2010) personal commitments typically involve decisions to uphold a principle, or create some personal obligation. Commitment takes the form of ongoing decision-making, whereas personal values can be seen as the principles being upheld by the commitment. For instance, I may hold a personal value that the natural environment is valuable in its own right, but my personal commitment is my continued decision-making and follow through in enacting behaviours that limit my damage to the environment.

The table illustrates that respondents with strong SES scores exclusively referenced a high personal commitment to sustainability; as illustrated by a strong SES scoring respondent's quote: **I am very committed to sustainability in my organisation**. None of the respondents with moderate or weak SES referred to this antecedent.

Table 4.18 Distribution of coding for Personal commitment to sustainability

	STRONG SES			MODERATE SES			WEAK SES		
Antecedent perceived importance →	H	M	L	H	M	L	H	M	L
Personal commitment to sustainability	11	0	0	0	0	0	0	0	0

I found few references to employees' personal commitment to sustainability in the organisational literature, however in a number of studies the personal commitment of managers has been associated with the success of the majority of organisational environmental practices: pollution prevention, stakeholder consultation, ISO 14001 implementation, employee participation, industrial ecology etc. (Cordano & Frieze, 2000; Egri & Herman, 2000; Kearins & Collins, 2012).

In summary, personal, situational and task elements play a part in the formation of judgements for self-efficacy (Gist & Mitchell, 1992). In this section, I identified eight important antecedents that inform these judgements, and which in turn influence an individual's assessment of their self-efficacy for sustainability. Each antecedent was discussed in the light of its relationship to the related factor/s and SES. Next, I describe the relationships between antecedents and CES factors.

#### **4.6.2 CES antecedents**

Figure 4.2 outlines my proposed model of the antecedents of Collective Efficacy for Sustainability (CES). I propose that CES is influenced by three core factors (Collaboration, Resilience, and Vision), each with an associated set of antecedents. Depending on the relative perceived importance of the antecedents (high, medium or low), they will either strengthen or weaken an individual's judgement of their group's Collaboration, Resilience or Vision, and therefore their CES. As noted in the description of the SES model in Section 4.6.1, efficacy builders are included to show a more complete model, but are not the focus of the research. Although Bandura (1982) acknowledged efficacy builders as key for the construction of collective efficacy, he also argued that it is an individual's cognitive appraisal and integration of these experiences that ultimately affect collective-efficacy.

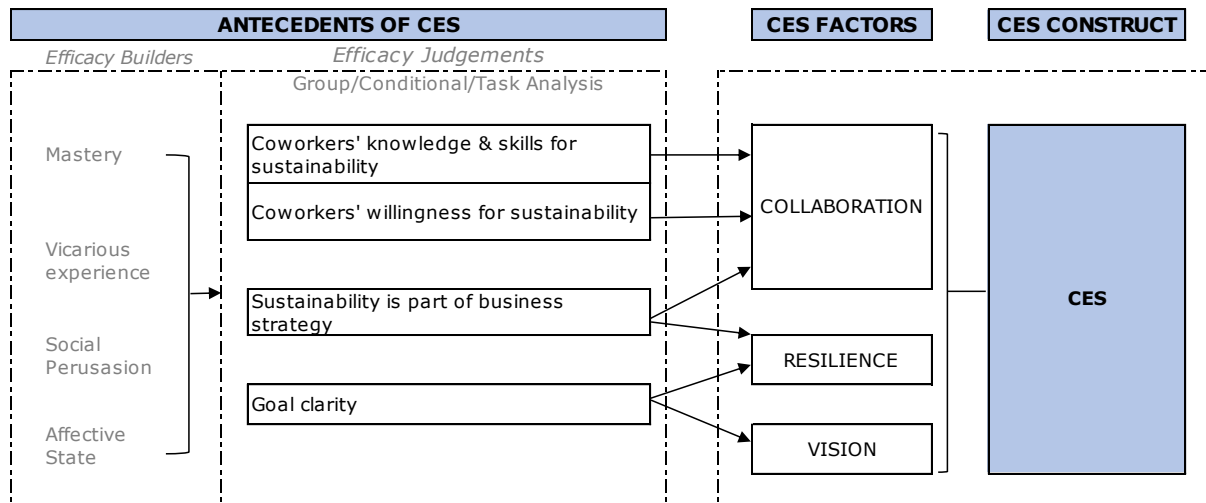


Fig. 4.2 Proposed model of antecedents of Collective Efficacy for Sustainability (CES)

In Chapter 3 I described the exploratory and confirmatory factor analysis of the collective-  
efficacy for sustainability (CES) survey items, which revealed the viability of the factors of  
Collaboration, Resilience and Vision. My subsequent qualitative analysis involved mapping  
prevalent codes, which appeared in response to certain items, through to the items'  
relevant factors. This process identified the key antecedents of the CES factors as follows:

- Collaboration has three key antecedents: *Sustainability is part of business strategy*, *Co-workers' knowledge and skills for sustainability* and *Co-workers' willingness for sustainability*.
- Resilience has two key antecedents: *Sustainability is part of business strategy* and *Goal clarity*
- Vision has one key antecedents: *Goal clarity*

The perceived relative importance of these conditions informs the judgements an  
individual makes when assessing CES. Next, I discuss the antecedents, grouped by their  
related factors.

## CES Factor: Collaboration

As explained in Chapter 3, Collaboration is an individual's perception of the extent of their group's ability to work together to make changes to everyday workplace behaviours to pursue their organisation's sustainability goals. Respondents most frequently referenced *Sustainability is part of business strategy*, *Co-workers' sustainability knowledge and skills*, and *Co-workers' willingness for sustainability* as influencing their judgements of Collaboration.

### Collaboration (CES) - Sustainability is part of business strategy

I define *Sustainability is part of business strategy* as an individual's perception of the degree to which sustainability is integrated into their organisation's business strategy. The distribution table illustrates that respondents with strong CES scores referenced high integration of sustainability in their organisation's business strategy. Whereas, those with medium or weak CES scores, referenced low integration of sustainability into strategy.

Table 4.19 Distribution of coding for Sustainability is part of business strategy

	STRONG CES			MODERATE CES			WEAK CES		
	H	M	L	H	M	L	H	M	L
Antecedent perceived importance →									
Sustainability is part of business strategy	6	0	0	1	0	10	0	0	4

The findings suggests that where sustainability is perceived to be part of the business strategy, employees perceive that their group is better able to collaborate to integrate sustainability. A strong CES scoring respondent noted: **this [sustainability] has been a part of corporate communication over the last 3-4 years [...] I believe that this is a part of the corporate strategy from the top down.** I interpreted the second part of this quote to mean that the respondent clearly perceived that sustainability is entrenched into their business strategy. On the other side of the spectrum, an example of a quote from a weak CES scoring respondent went as

follows: **They [co-workers] are very much focused on the core business objectives, (which is not sustainability inclusive), and are fairly blind to aspect[s] of sustainability.** I interpret that the reference to business objectives not being sustainability inclusive to mean that sustainability was not integrated into strategy.

While I was able to find little in the organisational literature on the link between employee collaboration and sustainability integrated into business strategy, it stands to reason that where sustainability is apparently formally approved by leadership (being well integrated into the business strategy), employees will perceive they are mandated to act on these business objectives. Pro-sustainability action taken by employees would thus be aligned with the goals of the business and leadership. Employees are more likely to act as they would expect support rather than resistance from leadership. Paillé and Raineri (2015) found that those who perceived low organisational support, showed a reduced willingness to perform eco-initiatives. Moreover a well-communicated, integrated business strategy means co-workers maintain their focus on group sustainability goals, and therefore collaborate towards the same objectives. On this basis the guiding structure of a sustainability-integrated business strategy should increase collaboration (for sustainability action) in the organisation.

#### Collaboration (CES) - Co-workers' sustainability knowledge and skills

I define *Co-workers' sustainability knowledge and skills* as an individual's perception of the degree to which co-workers are informed and familiar with the principles of sustainability and their application to enable the group to succeed in achieving their sustainability goals. The table illustrates that there was scant referencing of co-workers' knowledge and skills for sustainability by respondents with strong CES scores. Whereas, respondents with moderate to weak CES scores referenced low sustainability and skills among co-workers. This could indicate that where co-workers' knowledge and skills are perceived to be low, this is likely highlighted by employees as a constraint on their CES. But, if co-workers'

knowledge and skills are perceived to be high, it seems to fade into the background for respondents. A low CES scoring respondent commented: **There is still a lack of skills and competence, especially in the lower organisational levels and Sustainability [...] employees have no idea what it even means.** I interpreted the references to a lack of skills and employee knowledge of sustainability as indicating a lack of confidence in their co-workers' sustainability knowledge and skills.

Table 4.20 Distribution of coding for Co-workers' sustainability knowledge and skills

	STRONG CES			MODERATE CES			WEAK CES		
	H	M	L	H	M	L	H	M	L
Antecedent perceived importance →									
Coworkers' sustainability knowledge and skills	1	0	2	2	1	3	0	0	2

Prior literature informs us that when exercising collective efficacy, individuals share their resources, *knowledge and skills*, provide support, form alliances, and work together to realise what they cannot achieve on their own (Bandura, 2000, 2011; Gully et al., 2002; Alexander D Stajkovic, Lee, & Nyberg, 2009). This means that co-workers sustainability knowledge and skills is a key consideration when assessing CES as the group is dependent on each other's knowledge and skills to succeed in the task. Individuals within the group who lack faith in their team members' knowledge and skills to contribute to making the task a success expect a poor outcome despite their own best efforts, and are therefore unlikely to put in maximum effort and collaborate with the group (Bandura, 2000).

#### Collaboration (CES) - Co-workers' willingness for sustainability

I define *Co-workers' willingness for sustainability* an individual's perception of the degree to which their co-workers show a receptive and positive attitude towards integrating sustainability into their everyday workplace behaviours. Although there were a limited number of overall mentions for this antecedent, the table illustrates that respondents with

strong CES scores referenced high co-workers' willingness for sustainability. Furthermore, the table shows that respondents with moderate CES scores referenced low co-worker willingness for sustainability. A respondent with moderate CES score commented: **Even small changes at a practicing level are difficult to implement because of tired and stressed workforce with other more immediate priorities than environmental impact.** I interpreted this as a perception that co-workers were unwilling for sustainability due to being 'tired and stressed', and having 'other more immediate priorities'. Whereas a respondent with strong CES commented: **I am fortunate to work in an environment where my colleagues are open to [sustainability] suggestions, and where there is an active awareness towards a more sustainable working environment.** I interpreted the references to an openness to suggestions and active awareness as a willingness among this respondent's co-workers. None of the respondents with weak CES referred to this antecedent.

Table 4.21 Distribution of coding for Co-workers' willingness for sustainability

	STRONG CES			MODERATE CES			WEAK CES		
	H	M	L	H	M	L	H	M	L
Antecedent perceived importance →									
Coworkers' willingness for sustainability	2	1	1	1	1	4	0	0	0

It stands to reason that co-workers' willingness to enact a behaviour may indicate a propensity for greater group collaboration for that task. By its very nature collaboration is voluntary and is in essence an interpersonal process that requires both willingness and skills to be successful (San Martín-Rodríguez et al., 2005). Without individual willingness, there is unlikely to be an inclination to commit to the collaborative process.

Since many tasks within the organisational context are interdependent, an employee's CES is likely to strengthen where they perceive their co-workers are willing to act. The

employees, perceiving a willingness among the group, are therefore more likely to collaborate to achieve the goals set.

### **CES Factor: Resilience**

As explained in Chapter 3, CES factor Resilience is an individual's perception of the extent of their group's ability to recover from, or adapt to the effects of a change, and continue to pursue sustainability goals. Respondents most frequently referenced *Co-workers' sustainability knowledge and skills* and *Goal clarity* as influencing their judgements of Resilience.

#### Resilience (CES) - Co-workers' sustainability knowledge and skills

I define *Co-workers' sustainability knowledge and skills* as an individual's perception of the degree to which co-workers are informed about and familiar with the principles of sustainability and their application to enable the group to succeed in achieving their sustainability goals. This possible antecedent is discussed above in this section in relation to its role in contributing to Collaboration. I found that this antecedent also appeared to influence Resilience.

Employees recognise that a group's achievements are partly the product of shared knowledge and skills of its different members (Bandura, 2000). Without a belief that the group is knowledgeable and skilled enough to make the necessary changes to entrench sustainability, an individual employee in the group is less likely to persevere in their own efforts to make changes for sustainability (Bandura, 1998). In this way, confidence in co-workers' knowledge and skills is related to the resilience of the group. Moreover, individuals who perceive their group members to be highly competent respond less negatively when role conflict arises as they anticipate that others within their group can successfully contribute towards the completion of tasks (Verma & Sharma, 2014).

A high-scoring CES respondent noted: **I believe there is the skill set to continue to drive sustainability objectives within the [organisation].** I interpret the reference to 'the skill set' to indicate a strong sustainability knowledge and skills among this respondent's co-workers, and the phrase 'continue to drive' to imply a need to force 'something to go somewhere' indicating there is perceived resistance. Where there is the perception that co-workers can move things forward despite resistance, this indicates resilience.

### Resilience (CES) - Goal clarity

I define *Goal clarity* as an individual's perception of the degree to which their organisation expresses well-defined goals with respect to its sustainability vision. The table depicts that respondents with a strong CES score referenced high goal clarity. This is illustrated by a quote from a strong scoring CES respondent who noted: **because of their clear frameworks, you know what you need to do.** I interpret this to mean that this respondent perceives that management have provided clear guidelines and this has provided the respondent with a focus for action. Respondents with weaker CES scores referenced low goal clarity and is illustrated by this quote: **[...] not only is there a tenuous link to my daily operations there is also no clear measure or sustainability goals that I can easily recall. The only clear unambiguous goal within the organisation is the financial target.** I interpret the references to 'no clear measure or sustainability goals' as a lack of goal clarity for sustainability, and furthermore that the only clear goal is related to financial outcomes.

Table 4.22 Distribution of coding for Goal clarity

	STRONG CES			MODERATE CES			WEAK CES		
	H	M	L	H	M	L	H	M	L
Antecedent perceived importance →									
Goal clarity	6	0	0	0	1	4	0	1	1

Research has shown that setting challenging goals for people communicates confidence in their capabilities (Locke & Latham, 2002), which in turn encourages feelings of efficacy. To relate goals specifically to resilience, Locke and Latham (2002) noted that goals also affect persistence; and furthermore hard goals prolong effort when participants are allowed to control the time they spend on a task (LaPorte & Nath, 1976). As noted by Paillé and Raineri, (2015) defining clear goals can assist in avoiding confusion for employees regarding the organisation's intention, especially in the context of environmental policy implementation as part of the corporate strategy. In the case where management does not provide clear communication on, or indeed set any sustainability goals, it is unlikely employees will be persistent, or resilient after setbacks.

Bandura (1986) posited that individuals are disincentivised to act as a result of the degree of ambiguity associated with the task at hand. I translate this to the organisational context where a lack of direction derived from unclear organisational sustainability goals hinders employees from persevering in resolving issues and making changes.

### **CES Factor: Vision**

As explained in Chapter 3, Vision is an individual's perception of the extent of their group's sharing a common vision for achieving organisational sustainability. Respondents most frequently referenced *Goal clarity* as influencing their judgements of Vision.

#### Vision (CES) - Goal clarity

I define *Goal clarity* as an individual's perception of the degree to which their organisation expresses well-defined goals with respect to its sustainability vision. This possible antecedent is discussed above in this section in relation to its role in contributing to Resilience. I found that this antecedent also appeared to influence Vision.

A goal is a specific target to achieve something. Goals make up the strategy and tactics used to move toward a vision. Vision is the shared, big picture, and goals acting as

milestones along the way provide a roadmap for employees to see how attaining the vision is possible. When individuals are unclear about what they are trying to accomplish their motivation is low and their efforts inefficiently applied (Bandura, 1988). Goals serve a directive function as they channel 'attention and effort toward goal-relevant activities and away from goal-irrelevant activities' (Locke & Latham, 2002). Furthermore, giving people specific goals to achieve, rather than vague instructions, also increases their motivation (see Bryan & Locke, 1967; Locke & Bryan, 1966; Locke & Latham, 2002). The quote: **We have very few sustainability goals** from a weak CES scoring respondent is an illustration of how the lack of goals can be associated with weak CES.

In concluding this discussion of antecedent relationships, I propose that group and situational elements impact the formation of judgements for collective efficacy, just as personal and situational elements influencing the formation of judgements for self-efficacy (Gist & Mitchell, 1992). In this section, I proposed four important antecedents that inform these judgements, and which in turn influence an individual's assessment of their collective-efficacy for sustainability.

In Chapter 4, I described the qualitative research which underpinned the exploration of the relationship between efficacy judgements, factors and hence SES or CES. Additionally I theorised a model of the antecedents of each of SES and CES. Next, I discuss the implications of these findings.

## **CHAPTER 5: DISCUSSION**

The focus of my thesis was, first, on developing the constructs of self- and collective efficacy for sustainability, second, on building scales to test these constructs and, third, on theorising models of the antecedents of SES and CES. To develop and ensure the validity of the scales, I drew on pre-existing scales and the literature on scale development, efficacy and organisational sustainability theory, as well as statistical techniques. To theorise the models of antecedents, I adopted an empirically grounded, exploratory research strategy in which I analysed data from surveys and supplementary interviews to identify the judgement factors – personal, group, or situational circumstances – that influence an individual’s self- and collective efficacy for sustainability. In this chapter, I discuss the contributions I make to research on organisational sustainability, specifically, the motivational drivers of pro-sustainability behaviours. I then discuss the contributions to practice suggested by my findings. I conclude by discussing the limitations of my thesis and suggesting avenues for future research.

### **5.1 Contributions to Research**

My thesis makes three contributions to our understanding of the motivational drivers of employee sustainability behaviour. First, I developed the constructs of self- and collective efficacy for sustainability, including their underpinning factors. Second, I developed a survey instrument with which to measure SES and CES. Third, I proposed models of the antecedents of SES and CES, theorising the conditions that inform individuals’ judgements when assessing their own SES and CES. I discuss these contributions in more detail below.

With respect to efficacy theory, this work also contributes by expanding the limited research on assessing efficacy in organisational contexts (Bohn, 2010; Gist, 1987), and by applying both self- and collective efficacy to employee sustainability integration behaviours.

## **Development of SES and CES constructs**

Organisations that desire pro-sustainability behaviours are also interested in understanding how to design policies, practices, and procedures that will foster them. Yet, while progress has been made on measuring pro-sustainability behaviours (Olivier Boiral & Paillé, 2011; Olivier Boiral et al., 2013; Paillé & Boiral, 2013), there were no constructs directed at understanding the propensity for employees to engage in those behaviours. Instead, researchers have relied on proxies, such as whether employees are aware of the company's sustainability policy (Linnenluecke et al., 2009; Ramus & Steger, 2000). As a result, both researchers and practitioners lament a perceived disconnect between organisational efforts to spur sustainability and employees' everyday behaviours. To understand this phenomenon, it is necessary to understand to what degree organisational members perceive that they can successfully perform the tasks that support the organisation's sustainability agenda. Thus, the development of the constructs of SES and CES will help researchers to conceptualise and assess the extent to which employees perceive that they and their peers can act in an environmentally and socially sustainable manner as they go about their daily work activities.

The development of these constructs also helps to direct attention toward employees as individuals and their perceptions and motivations in driving organisational change towards sustainability. Despite the topic of environmental sustainability having attracted considerable academic attention, very little research has focused on what drives employees to engage in pro-environmental behaviours in organisational settings (Lo et al., 2012), and by extension, pro-sustainability behaviours. To date, scholarship about business and the natural environment has been predominantly about addressing company- and industry-level phenomena, with little attention paid to intra-organisational processes and individual behaviours (Andersson, Jackson, & Russell, 2013; Hofman & Newman, 2014; Norton, Parker, Zacher, & Ashkanasy, 2015; IPCC, 2014; KPMG, 2005). Yet as

Jackson, Ones and Dilchert (2012) have emphasised, the involvement of all employees at all levels is a vital factor in the promotion of environmental sustainability. To do this, exploring the perceptions that employees hold concerning factors that motivate them to work (and integrate sustainability at work) will be important (Wiley, 1997). Through the development of the constructs of SES and CES, I address these calls for a greater focus on individual employees and their propensity for sustainability behaviours. Indeed, while researchers have tended to focus on the motivations and behaviours of leaders, the impact of the actions of everyday employees on organisational sustainability may prove more significant than this overriding focus on leadership would have us believe.

### **Development and validation of SES and CES scales**

Organisations are under increasing pressure to shift their organisational cultures towards sustainability (Bertels, Papania, & Papania, 2010), which will require employees to make changes in their everyday workplace behaviour. Yet, Gifford and Nilsson (2014) lament the confusion that results from the multitude of factors that influence pro-environmental behaviour, noting the likely reason for this is that “many of the factors influence each other through moderation or mediation. Some overwhelm others in their impact, but those others may appear to have effects if they are considered in isolation.” As noted, until now researchers have had to rely on proxy measures to assess the propensity for employees to engage in sustainability behaviours – the development and validation of a set of SES and CES scales helps address this gap. Thus, it is clear that researchers will benefit from a way to assess employees’ readiness in order to build further understanding about how best to motivate changes in their behaviours. The creation of SES and CES scales provides a useful research tool to advance empirical research by allowing the measurement of a previously ‘unmeasurable’ abstract concept (Trochim, 2000) - the propensity for sustainability behaviour in the workplace. Although the scales are yet to be empirically

tested to predict outcomes (pro-sustainability behaviours), based on the theory of efficacy strong levels of measured SES and CES should predict these behaviours.

These scales can be used to support cross-sectional or longitudinal studies comparing SES and CES and/or comparing their antecedents and consequences. The survey scales also lend themselves to experimental research, thus contributing to an emerging emphasis on experimental methods in organisational sustainability research (Delmas & Aragon-Correa, 2016). Thus, these scales will assist researchers in developing greater insights into the antecedent conditions of pro-sustainability behaviours and help inform the development of interventions best suited to shift organisational sustainability behaviours over the long term.

The relevance of these scales is premised on their theoretical justification, as well as my interactions with both scholars and practitioners in developing them. Their usefulness is based on their solid psychometric properties, but admittedly tempered by the statistical methods weaknesses noted in the limitations section. The results of the factor analysis supported the theoretical contention that the factors measured were discrete and, based on the review of the literature and the statistical results, my findings indicate that these scales do indeed measure SES and CES. The data were subjected to intense statistical analysis, and the reliability indices are strong. Cronbach's alpha reliability coefficients were all satisfactory. Lastly, the scales were developed and trialled with respondents from multiple countries and further strengthened using a large sample of employees in a real company. The scales can therefore be used with confidence in analysing SES and CES within a range of organisational settings.

### **Theorising the antecedents of SES and CES**

In Chapter 4 I theorised the antecedents of SES and CES, helping enrich our understanding of how employees form judgements about their self- and collective efficacy for

sustainability. As proposed in Gist and Mitchell's (1992) theoretical analysis of self-efficacy, the assessment of personal and situational resources or constraints has a significant impact on the formation of efficacy judgements. Whereas Gist & Mitchell (1992) theoretically identified the types of efficacy judgements that might take place in processing past experiences, I applied this thinking empirically by identifying significant antecedents for SES that result from cognitive appraisal of personal and situational conditions and to a lesser extent, task assessment. Furthermore, I extended this empirical testing to include CES, which had not been included in Gist and Mitchell's (1992) theorising.

### SES judgement factors

The SES model provides a number of insights into the levers for sustainability behaviour change. While one might well expect *Role influence* to play a significant part in building SES, the appearance of the antecedent *General personal influence* suggests that influential employees, irrespective of their formal role, are likely to play an important role in making or supporting changes for sustainability. This further reinforces the call for organisational sustainability research to look beyond their predominant focus on leaders or sustainability managers (see Howard-Grenville, Golden-Biddle, Irwin, & Mao, 2011; Post & Altma, 1994), and also informs ongoing work on the personal characteristics of champions (e.g., Frost & Egri, 1991; Howell & Higgins, 1990; Markham, Green, & Basu, 1991).

For encouraging the factor of Understanding, the model points to the importance of building employees' sustainability knowledge and their experience in applying that knowledge. Several authors have pointed to the value of experiential learning in supporting sustained change in individuals and organisations (Kolb, 1984:38; Svoboda & Whalen, 2005). Thus, the inclusion of work experiences as an antecedent points to the need to find mechanisms to allow employees to apply their knowledge experientially, thus augmenting their knowledge with work experience.

Resilience with respect to sustainability behaviours appears to be strongly influenced by an individual's philosophical underpinnings, such as personal values and personal commitment to sustainability. Personal beliefs and principles underpin a concept that Polk (1997) would describe as the 'philosophical pattern'. While Polk's work also identified relational, situational and dispositional patterns as antecedents of resilience, these did *not* come to the fore in my findings, suggesting that the philosophical pattern is particularly pertinent in the area of sustainability change.

### CES judgement factors

The CES model theorised here points to the need to integrate sustainability into business strategy and clearly outline sustainability goals. These are commonly highlighted as broadly important for organisational sustainability (Bertels et al., 2010; Borland, 2009; Leon-Soriano, Munoz-Torres, & Chalmeta-Rosalen, 2010; Mirchandani & Ikerd, 2008), but my research emphasises their more specific role in enhancing CES. My model also identifies the need to find mechanisms to build and surface co-workers' sustainability knowledge and skill, (as prioritised by Boiral, (2002); DeJonghe, Doctori-Blass, & Ramus (2009); Remmen & Lorentzen (2000)), but in addition it also highlights the importance of employees' willingness for sustainability change.

There has been some debate in the efficacy literature over the method for measuring collective efficacy. In the past, collective efficacy has been measured both as an average of self-efficacy scores of individuals, or as an average of the collective efficacy scores of individuals (Goddard et al., 2004). The models developed here show that the antecedents for SES and CES differ. It would therefore be important that CES researchers follow the measurement method based on individuals' assessments of group efficacy, rather than averaging individuals' SES scores.

## 5.2 Contributions to Practice

My findings also have important practical implications, especially for corporate managers tasked with fostering sustainability behaviours among employees. I discuss my practical contributions associated with the SES and CES survey instrument and the identified antecedents in the sections below.

### Development of SES and CES scales

For organisations desiring a change toward sustainability, this practical assessment tool will enable them to support that shift. The development of a set of parsimonious scales for SES and CES applicable in a broad range of organisations offers managers a means to measure what impact their efforts to embed sustainability may be having among their employees. Organisations will be able to administer the survey, implement new initiatives and then re-administer the survey at a later date to assess changes in their employees' perceptions of whether they and their peers can act in an environmentally and socially sustainable manner as they go about their daily activities.

Survey results could assist managers in:

- identifying opportunities to increase employees' efficacy for sustainability, by motivating and informing efforts targeted at a particular demographic grouping;
- identifying employees with strong self-efficacy to champion new and challenging projects, such as spearheading sustainability programmes;
- identifying employees with a strong sense of SES to encourage them to set higher performance goals as these employees thrive on the challenge (Lunenburg, 2011);
- learning why some parts of an organisation (departments, divisions, or geographic regions) are scoring higher, so they could be used as exemplars for others.

Practically, the survey items can be combined with other employee surveys, or incorporated as part of regular employee assessments. They are also parsimonious. Long

surveys can put a strain on organisations, or provide too much data that may overwhelm participants and managers. I provide practical guidance for practitioners on the application of the survey in Section 3.2.

### **Identification of the factors and antecedents of SES and CES**

From a managerial standpoint, my research findings point to the importance of firstly understanding employees' self- and collective efficacy perceptions with respect to sustainability integration. This can be achieved by analysing the results of the survey at both the construct and factor level. Secondly, managers need to find ways to improve employees' SES and CES strength. By understanding the antecedents to efficacy judgements, managers can better target these interventions. For instance, practical implications for management for building SES include:

- incorporating specific sustainability-related duties into formal role descriptions, thereby leveraging role influence;
- selecting individuals with role influence for sustainability to sit on boards, committees and other organisational bodies;
- encouraging those with sustainability incorporated into their formal roles to be involved as much as possible, (where appropriate), in multiple projects across the organisation;
- encouraging and enabling employees to work on sustainability projects to build sustainability work experience and knowledge of sustainability;
- training employees thereby increase their knowledge of sustainability
- providing opportunities for experiential learning
- allowing employees greater control over their work processes, where appropriate, including supervised experimentation with integrating sustainability into work processes;

- selecting employees during recruitment processes, based on their personal commitment and values related to sustainability;
- providing ways for employees to enact their personal values and commitments to sustainability, such as volunteering programmes;
- identifying sustainability champions with general personal influence.

Through understanding the antecedents that influence how employees perceive their group's CES, organisational development and HR managers can also improve sustainability integration performances. For instance, practical implications for management for building CES include:

- integrating sustainability more explicitly into business strategy;
- communicating the sustainability goals of the organisation clearly and consistently;
- breaking down departmental silos to allow employees to realise the extent of their co-workers' knowledge and willingness for sustainability;
- encouraging cross-functional teamwork on sustainability projects.

### **5.3 Avenues for Future Research**

This work also promotes areas for future research. Responding to recent calls for more experimental research in organisational sustainability (Delmas & Aragon-Correa, 2016), future research could empirically test the relationship between the antecedents identified in this study and individuals' SES and CES, thus investigating whether the antecedents do indeed influence the factors and ultimately the constructs. This could be achieved with an additional survey and the relevant statistical tests, such as structural equation modelling.

For instance, future research could investigate how much a variation in *Control* impacts employees' SES. The antecedent of *Control* refers to employees' perception of the how much autonomy they have to adjust their work and allied processes to integrate sustainability. Within organisations varying degrees of managerial control over others'

work is needed for the organisation to function. Researchers would benefit from a better understanding of how much freedom employees should be allowed for adjusting for sustainability so as to maximise the independent application of sustainability to employees' work. Future research could also review the antecedent of *Control* as an organisation shifts towards greater sustainability integration; assessing whether the impact of *Control* remains as significant as is depicted in the SES model as the organisation shifts more deeply towards a culture of sustainability.

Secondly, investigating sustainability experience outside of the working context (such as volunteer work, or sustainability practices in the home) was beyond the scope of this research, but comments referring to external sustainability experiences were made during the interviews. Future research could examine the potential impact of sustainability experiences outside of the workplace on influencing SES. Researchers could ascertain how external experiences measure up against the antecedent of *Sustainability work experience*, particularly in organisations with a limited culture of sustainability.

To extend the work of Effeney and Davis (2013), future research could analyse whether *perceived* Co-workers' knowledge and skills for sustainability and *actual* Co-workers' knowledge and skills for sustainability are equally impactful. This would have consequences for designing sustainability training programmes and interventions to correct perceptions of co-workers' abilities. Together these studies could help to better inform ways to increase workplace sustainability.

Another potentially fruitful area of research is to better understand the extent to which SES and CES is predictive of sustainability behaviours. An opportunity exists within research (and practice) to link efficacy levels to organisational practices such as positive sustainability-orientated behaviours, staff engagement ratings, or other measurable outcomes, such as waste reduction or carbon footprint. I also invite further research on the antecedent model to confirm our assumption that SES and CES lead to Pro-

Environmental Behaviours and extend to pro-sustainability behaviours. The survey instrument could also be applied on an ongoing basis, year-on-year, to track trends in employee efficacy for sustainability through the life of the organisation. In this way, researchers can assess the relative success of different types of programmes in building SES and CES, ultimately identifying best-practices for creating SES and CES. Additionally, they could also map why particular individuals' SES or CES may have changed significantly, for the better or worse, thus further validating the existing judgement factors, or identifying additional ones for exploration.

Moving beyond sustainability outcomes, future researchers could also examine other outcomes, such as teamwork or even organisational-level outcomes, thereby introducing multi-level analysis. It may be interesting to see whether efficacy building for sustainability might have positive impacts in other areas of organisational functioning, such as co-operation, engagement, and efficiencies in work processes.

The use of fuzzy cognitive mapping (FCM) could be another avenue for extending the theorising of antecedent relationships. FCM (represented in graph structures) allows hazy degrees of causality between concepts, and is especially applicable in soft knowledge domains (Kosko, 1986). This technique may be useful for future researchers who may choose to follow the techniques described in Chapter 4, which dealt with 'soft knowledge' qualitative information collected from scale and interview respondents.

Future research opportunities for improving the scale development process could also be considered. Firstly researchers could consider the use of Item Response Theory (IRT) which has a number of advantages over classical test theory which used in this thesis. These two methodologies are generally consistent and complementary, and manage the same problems but are differing bodies of theory and require different methods. Using IRT could take advantage of the differences, such as being able to compare the difficulty of an item and the ability of a person (Embretson & Hershberger, 1999).

Secondly, the use of chi-square analysis, which measures how well the observed distribution of data fits with the distribution that is expected if the variables are independent, is another possibility to strengthen the concordance testing of the Phase 5 MBA data set. In this same phase of the research, researchers could also take advantage of receiver operating characteristic curves, i.e. ROC curve, to further analyse the free-from answers to item scores.

#### **5.4 Limitations**

As with any study, my thesis has limitations. These include the possibilities of response bias, potential issues related to convergent validity during the scale development, scope limitations, and statistical methods.

##### **Response Bias**

First, there is the possibility that some respondents' answers may have been affected by social desirability bias, whereby they may have desired to present themselves as strongly confident about behaviours for integrating sustainability at work. While I acknowledge this possibility, I feel it was mitigated because participation was voluntary, anonymity assured, and Finco management only received a high-level summary of findings without any respondent identifying information. Indeed, as outlined throughout the findings, a number of participants did express low self- and collective efficacy for sustainability.

Second, it is possible that the data were affected by the common rater effect of acquiescence, which is the propensity for respondents to agree (or disagree) with survey items independent of their content (Podsakoff et al., 2003). Despite assurances of anonymity, these effects might have played a role in Phases 4 and 5, in which the survey was circulated by management or lecturers. I sought to mitigate such effects by removing straight line answers during the survey data processing.

Third, due to the intrinsically complex nature of the topic of sustainability, misunderstanding of items could also have led to inaccurate findings. It became evident during interviews that not all respondents understood the concept of sustainability. However, I am confident that, in most cases, this was mitigated through the use of explanations of sustainability on the landing page of the survey and the click-through links for more descriptive details. I also made a strong effort to simplify the items as much as possible, without losing the meaning, as described in Section 3.1.4.

Finally, responses may have been influenced by positive and negative affect and mood states. Affectivity refers to the propensity of respondents to view themselves and the world around them in generally negative terms (negative affectivity) or in generally positive terms (positive affectivity); while transient mood states refer to the particular mood of the individual when answering the survey (Podsakoff et al., 2003). For example, one respondent noted: [...] **it also depends at the time when these things come. Sometimes you find you get this survey and maybe you're upset. Maybe your manager upset you. You also start answering it in that way. You want to get back at them.** There is not much a researcher can do to mitigate survey respondents' moods, however I am confident that the high survey respondent number (781) may have assisted in diluting the affect/mood possible effect. Overall, therefore, there are several possible response bias effects, but I am confident that I have been able to sufficiently mitigate them in my research.

### **Challenges with Convergent Validity for the CES Scale**

When tested for convergent validity CES had low significance and was positively related to the Collective Efficacy Beliefs scale (CEB) ( $r=.30$ ). This denotes only marginal evidence of convergent validity. The low convergent validity score weakens the argument that CES has been appropriately defined within its nomological context, raising some doubt on whether the items developed really do test the construct of CES. Future research should therefore identify and empirically examine other scales against CES, or conduct convergent

validity tests with an increased sample size. Another approach could be to redevelop or produce additional CES items. However, this approach is probably the least productive, as the Exploratory Factor Analysis testing has shown good results for the existing items.

### **Scope limitation**

This research tested the survey in only one live corporate environment, Finco. It would be preferable to apply it in a number of different organisations to further solidify its statistical strength across different populations and thus establish the survey's generalisability across organisational types and cultures. Additionally, using one company (Finco) for Phase 4 is a limitation in terms of the risk of overfitting to the company. I tried to overcome this by pairing in-depth work in Finco with responses from people from a range of companies in earlier phases (sourced through Qualtrics), and in later Phase 5 with MBA students.

### **Statistical methods**

In retrospect, Phase 2 EFA and CFA should not have been run on the same data set. Instead I should have split the data in half, and performed EFA on one half and CFA on the other half. This was an oversight in my methodology and should not be considered standard practice. Similarly, it would have been good practice to re-run CFA on the revised Phase SES and CES scales, before testing for convergent and divergent validity. In addition the large first factor eigenvalues apparent during EFA testing (Phase 2), as well as the single-factor tests showing good fit for both SES and CES, may indicate common method bias is present. Podsakoff et al. (2003) recommend testing for this, using Harmon's single factor test for example. This could be addressed in future research. Additionally, in the testing for convergent and divergent validity, Table 3.19 presents the p values of the correlations rather than the correlations themselves. It is usual to present the beta weights of the correlations and note the p values using superscripts \* for .05 and \*\* for .001. This table should be restated by future researchers so that it shows the correlations rather than

merely the p values. Correlational cut-offs have been shown for Phase 3's convergent and divergent testing, but the results of correlations were not produced. For all phases details of the means of demographic variables as well as ranges should have been included in correlation tables. It would also have been preferable to run EFA and CFAs on later versions of the scale (in Phases 4 and for the reduced item scale in Phase5), as a check that changes to items had not shifted the factorial analysis of the scales. This weaknesses should be remedied in future research.

## **5.5 Conclusion**

While both practitioners and scholars recognise the benefit of integrating sustainability into every day work (Baumgartner, 2009; Bertels, 2010; Ceres, 2010; Paraschiv et al., 2012; Schneider et al., 1996)(Baumgartner, 2009; Bertels, 2010; Ceres, 2010; Paraschiv et al., 2012; Schneider et al., 1996) we have less of an understanding about the antecedents of the behaviours necessary to accomplish this. Moreover, accomplishing sustainability integration will require the cooperation of employees to make changes in their everyday work processes (Norton, Zacher, & Ashkanasy, 2012; Ramus & Steger, 2000; Robertson & Barling, 2013). Many researchers have worked on explaining the gap between individuals having environmental knowledge and awareness, and exhibiting pro-environmental behaviour (Kollmuss & Agyeman, 2002). Additionally, there has been some progress in measuring sustainability behaviours, but measures of employees' perceptions of their ability to integrate sustainability changes remain underdeveloped. In my thesis, I sought to better understand the antecedents of employees' sustainability integration behaviours, and how to measure them.

To address this I developed constructs and tools to help organisations assess their employees' propensity for sustainability action. Adopting an empirically grounded, exploratory research strategy, I developed the constructs of self- and collective efficacy for sustainability (SES, CES), validated an instrument that assesses their strength within

the organisational context, and analysed empirical data to theorise models of SES and CES antecedents. I applied factor analysis to conceptualise and understand the constructs of SES and CES, identifying Capacity, Understanding and Resilience as the factors underpinning SES; and Collaboration, Resilience and Vision as underpinning CES. By performing a configurational analysis of the data gathered from the surveys and interviews, I identified eight SES antecedents and four CES antecedents.

Theoretically I contribute to our understanding of the motivational drivers of employee pro-sustainability behaviour through the development of constructs of SES and CES. These constructs help researchers to conceptualise and assess the extent to which employees perceive that they and their peers can act in an environmentally and socially sustainable manner as they go about their daily work activities. This work also answers the call for research at the individual employee level. The scales provide researchers a way to assess employees' readiness helping to build further understanding of how best to motivate changes in their behaviours. The models of antecedents provide insights into the likely conditions necessary to ensure stronger SES and CES. This work provides managers tasked with sustainability integration a tool to measure employees' propensity to embed sustainability, pre- and post-sustainability intervention impacts, and practical guidance on how to implement the survey tool. Additionally, the identification of the antecedents guides managers to focus on particular areas to be strengthened, thereby leveraging the positive motivational effects of SES and CES to bring about shifts in organisational sustainability behaviours.

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## APPENDICES

### APPENDIX A: Phase 2 Survey documents

A.1 Content provided to Phase 2 contacts to send to respondents.



### Email invite from company reps to potential participants [customize for each company]

I would like to invite you to help support research in the area of business sustainability. [INSERT COMPANY NAME] has been participating in a research study on embedding sustainability led by Dr. Stephanie Bertels at Simon Fraser University, Canada. Her research team, including a Masters student at the University of Cape Town in South Africa, Andrea Ferry, are piloting a survey tool that focuses at the employee level.

[INSERT COMPANY NAME] would like to better understand how sustainability is currently being embedded throughout our organization and you have been identified as someone who could help pilot their online survey. No preparation is required for participating in this survey and your responses would be anonymous. The time commitment is approximately 15 minutes.

If you are willing to participate, please click on the link below:

INSERT LINK TO COMPANY SPECIFIC EMAIL COLLECTION SURVEY

## A.2. Phase 2 Survey Introduction page

6/30/2015

Qualtrics Survey Software



BEEDIE SCHOOL  
OF BUSINESS  
SIMON FRASER  
UNIVERSITY

### Introduction

Thank you for agreeing to support research in the area of business sustainability. This research is part of the Network for Business Sustainability's embedding sustainability project hosted at Simon Fraser University in Canada.

This survey has been designed by Andrea Ferry, a Masters student at the University of Cape Town. This research has been approved by the Commerce Faculty Ethics in Research Committee at the University of Cape Town in South Africa. Your participation is voluntary. If you choose to participate, you may still choose to withdraw from the study without giving a reason and without prejudice. We are only interested in aggregate data. You will not be identified by name. We cannot, however, guarantee confidentiality due to the inherent risks associated with the electronic transfer of information.

We are developing a survey instrument to help companies understand the extent to which employees are willing to engage and are engaging in activities that help an organization deliver on its sustainability commitments, which include the protection of the environment, the promotion of healthy communities, and doing business with appropriate governance practices.

There are 4 sections focused on 1) you as an individual 2) your company as a whole 3) activities that you undertake and 4) your details (gathered for statistical purposes).

Your participation is voluntary. If you choose to participate, you may still choose to withdraw from the study without giving a reason and without prejudice.

- I agree to participate in this survey  
 I do not agree to participate in this survey

### Demographics

Due to the nature of the study you will be asked to provide the researchers with some form of identifiable information. However, all responses will be confidential and used for the purposes of this research only.

This data will be used only to assess the representativeness of our sample.

## APPENDIX B: Phase 2 Item Correlation Matrices

Phase 2 SES Correlation Matrix																
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. I am confident I can take the time to reflect on how my work needs to be adjusted to reduce my organization's negative environmental and social impacts.	1.000	.610	.562	.572	.554	.564	.580	.517	.525	.562	.596	.560	-.080	.562	.164	.496
2. I am confident that I can complete my work in a way that is in alignment with my organization's sustainability goals.	.610	1.000	.525	.566	.636	.636	.587	.532	.491	.687	.551	.553	.056	.543	.255	.397
3. I am confident in making suggestions to my colleagues about ways to be more sustainable.	.562	.525	1.000	.685	.620	.638	.670	.538	.661	.628	.639	.640	-.015	.615	.244	.549
4. I am confident in my ability to make changes to my work that deliver on my organization's sustainability commitments.	.572	.566	.685	1.000	.660	.643	.689	.652	.642	.656	.631	.694	-.018	.570	.267	.531
5. At work, it is easy for me to stay positive about achieving our sustainability goals and aims.	.554	.636	.620	.660	1.000	.613	.666	.561	.600	.685	.548	.635	-.005	.603	.240	.464
6. I am confident that I can play a role in helping this company to become more sustainable.	.564	.636	.638	.643	.613	1.000	.642	.555	.608	.646	.614	.572	.007	.617	.294	.551
7. I am confident in my ability to make changes in my daily tasks in order to work more sustainably.	.580	.587	.670	.689	.666	.642	1.000	.525	.536	.615	.591	.695	-.041	.563	.214	.442
8. In my work, I am confident that I can incorporate environmental, social and governance factors into my decision making.	.517	.532	.538	.652	.561	.555	.525	1.000	.624	.585	.574	.602	-.039	.612	.226	.515
9. I am confident in my ability to explain to my colleagues how sustainability relates to my work.	.525	.491	.661	.642	.600	.608	.536	.624	1.000	.663	.649	.620	.022	.638	.303	.603
10. Even in the face of challenges, I am confident that I can undertake my work in a way that aligns with our organization's sustainability goals.	.562	.687	.628	.656	.685	.646	.615	.585	.663	1.000	.637	.630	.008	.608	.268	.486
11. Even when there is limited support for the changes I am trying to make to improve the sustainability performance of our organization, I still persevere.	.596	.551	.639	.631	.548	.614	.591	.574	.649	.637	1.000	.650	-.058	.611	.160	.604
12. I am confident in my ability to alter the work that I do in a way that improves the sustainability performance of this organization.	.560	.553	.640	.694	.635	.572	.695	.602	.620	.630	.650	1.000	-.064	.604	.219	.523
13. The challenges to improving the sustainability of the work that I do are so great that I am unmotivated to pursue change	-.080	.056	-.015	-.018	-.005	.007	-.041	-.039	.022	.008	-.058	-.064	1.000	.019	.546	-.079
14. I am excited to try out new ways of working that will contribute to delivering on our organization's sustainability strategy	.562	.543	.615	.570	.603	.617	.563	.612	.638	.608	.611	.604	.019	1.000	.292	.688
15. There's no point in me trying to improve the sustainability of the work that I do since it won't make a difference overall in our organization.	.164	.255	.244	.267	.240	.294	.214	.226	.303	.268	.160	.219	.546	.292	1.000	.174
16. I am actively looking for opportunities to improve my organization's sustainability performance.	.496	.397	.549	.531	.464	.551	.442	.515	.603	.486	.604	.523	-.079	.688	.174	1.000

Phase 2 SES Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
1. I am confident I can take the time to reflect on how my work needs to be adjusted to reduce my organization's negative environmental and social impacts.	78.09	210.480	.669	.528	.921

Phase 2 SES Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
2. I am confident that I can complete my work in a way that is in alignment with my organization's sustainability goals.	77.48	214.086	.703	.614	.920
3. I am confident in making suggestions to my colleagues about ways to be more sustainable.	77.84	207.746	.760	.637	.918
4. I am confident in my ability to make changes to my work that deliver on my organization's sustainability commitments.	77.81	209.097	.783	.681	.918
5. At work, it is easy for me to stay positive about achieving our sustainability goals and aims.	77.87	209.486	.745	.628	.919
6. I am confident that I can play a role in helping this company to become more sustainable.	77.65	209.576	.762	.622	.918
7. I am confident in my ability to make changes in my daily tasks in order to work more sustainably.	77.68	211.701	.733	.655	.919
8. In my work, I am confident that I can incorporate environmental, social and governance factors into my decision making.	77.90	209.753	.698	.556	.920

Phase 2 SES Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
9. I am confident in my ability to explain to my colleagues how sustainability relates to my work.	77.96	206.266	.765	.647	.918
10. Even in the face of challenges, I am confident that I can undertake my work in a way that aligns with our organization's sustainability goals.	77.74	210.614	.775	.670	.918
11. Even when there is limited support for the changes I am trying to make to improve the sustainability performance of our organization, I still persevere.	78.09	208.652	.736	.625	.919
12. I am confident in my ability to alter the work that I do in a way that improves the sustainability performance of this organization.	77.97	209.291	.750	.644	.919
13. The challenges to improving the sustainability of the work that I do are so great that I am unmotivated to pursue change	78.71	233.650	.041	.355	.942
14. I am excited to try out new ways of working that will contribute to delivering on our organization's sustainability strategy	77.82	206.488	.761	.652	.918

Phase 2 SES Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
15. There's no point in me trying to improve the sustainability of the work that I do since it won't make a difference overall in our organization.	78.27	215.351	.366	.422	.932
16. I am actively looking for opportunities to improve my organization's sustainability performance.	78.24	208.776	.636	.570	.922

Phase 2 CES Correlation Matrix																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. People in this organization can tackle our sustainability challenges.	1.000	.675	.086	.634	.499	.561	.559	.169	.632	.587	.121	.602	.648	.632	.623	.655	.724
2. This company has a strong vision for sustainability.	.675	1.000	.100	.684	.581	.738	.693	.178	.719	.773	.173	.708	.743	.700	.723	.689	.768
3. People in this organization are unsure of how they can contribute to our pursuit of sustainability	.086	.100	1.000	.081	.190	.095	.154	.545	.100	.128	.469	.053	.161	.114	.100	.167	.101
4. When this organization takes on a sustainability goal we are confident of achieving it.	.634	.684	.081	1.000	.636	.699	.688	.176	.692	.674	.097	.636	.715	.690	.736	.754	.681
5. People across this organization have a clear idea of where we are headed with regard to sustainability.	.499	.581	.190	.636	1.000	.752	.725	-.001	.584	.706	-.001	.616	.692	.548	.670	.618	.564
6. As an organization, we are very certain about what we will accomplish together in the area of sustainability.	.561	.738	.095	.699	.752	1.000	.729	.088	.679	.814	.130	.666	.740	.625	.719	.685	.691
7. People across our organization have a strong commitment to make our organization more sustainable.	.559	.693	.154	.688	.725	.729	1.000	.117	.683	.723	.120	.687	.760	.663	.739	.736	.692
8. As an organization, we are unlikely to achieve many of our environmental and social goals.	.169	.178	.545	.176	-.001	.088	.117	1.000	.154	.172	.550	.098	.176	.224	.134	.169	.188
9. As an organization, we pursue our sustainability goals, even when times are tough.	.632	.719	.100	.692	.584	.679	.683	.154	1.000	.741	.179	.678	.715	.714	.725	.707	.734
10. This organization is confident about its future path to sustainability.	.587	.773	.128	.674	.706	.814	.723	.172	.741	1.000	.187	.691	.739	.664	.723	.669	.711
11. When resources are scarce, sustainability would be less of a priority for this organization.	.121	.173	.469	.097	-.001	.130	.120	.550	.179	.187	1.000	.140	.142	.147	.120	.134	.184
12. People across our organization would try to improve our environmental and social impacts even in times of cost constraint.	.602	.708	.053	.636	.616	.666	.687	.098	.678	.691	.140	1.000	.750	.681	.695	.664	.707
13. People in this organization are able to mobilize to meet difficult and complex sustainability goals.	.648	.743	.161	.715	.692	.740	.760	.176	.715	.739	.142	.750	1.000	.720	.783	.720	.731
14. By working together, this organization can be a leader in environmental and social performance in its industry.	.632	.700	.114	.690	.548	.625	.663	.224	.714	.664	.147	.681	.720	1.000	.747	.714	.716
15. Our ability to work together makes me optimistic that we can improve our environmental and social efforts in this organization.	.623	.723	.100	.736	.670	.719	.739	.134	.725	.723	.120	.695	.783	.747	1.000	.779	.787
16. In this organization, everyone can work together effectively to meet our sustainability goals.	.655	.689	.167	.754	.618	.685	.736	.169	.707	.669	.134	.664	.720	.714	.779	1.000	.767
17. People in this organization are able to work together to reduce our environmental footprint and make a positive impact on communities.	.724	.768	.101	.681	.564	.691	.692	.188	.734	.711	.184	.707	.731	.716	.787	.767	1.000

Phase 2 CES Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
1. People in this organization can tackle our sustainability challenges.	79.64	279.474	.706	.601	.937
2. This company has a strong vision for sustainability.	79.66	268.440	.817	.743	.934
3. People in this organization are unsure of how they can contribute to our pursuit of sustainability	81.06	295.639	.234	.449	.948
4. When this organization takes on a sustainability goal we are confident of achieving it.	79.68	276.633	.782	.695	.935
5. People across this organization have a clear idea of where we are headed with regard to sustainability.	80.11	276.089	.700	.719	.937
6. As an organization, we are very certain about what we will accomplish together in the area of sustainability.	79.99	273.450	.795	.768	.935
7. People across our organization have a strong commitment to make our organization more sustainable.	79.80	271.948	.801	.720	.935
8. As an organization, we are unlikely to achieve many of our environmental and social goals.	80.42	292.266	.272	.481	.948

Phase 2 CES Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
9. As an organization, we pursue our sustainability goals, even when times are tough.	79.68	275.663	.799	.695	.935
10. This organization is confident about its future path to sustainability.	79.73	271.954	.825	.775	.934
11. When resources are scarce, sustainability would be less of a priority for this organization.	80.99	294.721	.254	.399	.947
12. People across our organization would try to improve our environmental and social impacts even in times of cost constraint.	79.98	274.446	.763	.666	.936
13. People in this organization are able to mobilize to meet difficult and complex sustainability goals.	79.81	272.094	.845	.764	.934
14. By working together, this organization can be a leader in environmental and social performance in its industry.	79.59	273.464	.787	.683	.935
15. Our ability to work together makes me optimistic that we can improve our environmental and social efforts in this organization.	79.64	272.881	.829	.775	.934
16. In this organization, everyone can work together effectively to meet our sustainability goals.	79.69	273.877	.815	.745	.935

Phase 2 CES Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
17. People in this organization are able to work together to reduce our environmental footprint and make a positive impact on communities.	79.54	274.413	.827	.772	.934

### APPENDIX C: Phase 3 Response Rates

Ph. 3	Company	Number of surveys circulated	Number of responses received	
			SES scale	CES scale
			<i>16 items</i>	<i>17 items</i>
NBS group	Company A	20	20	18
NBS group	Company B	31	20	18
NBS group	Company C	34	27	24
NBS group	Company D	38	25	21
Research co.	Qualtrics	266	200	200
	Total	389	292	281*
	Required minimum		160	170
	Exceeding quota by		132	111
	Response rate		75%	72%

\* Unfortunately a number of respondents who completed the SES scale did not complete the CES scale, hence the different number of received responses.

## APPENDIX D: Phase 4 Survey documents

### D.1 Survey Introduction Page.

6/9/2015

Qualtrics Survey Software



BEEDIE SCHOOL  
OF BUSINESS  
SIMON FRASER  
UNIVERSITY

#### Introduction

Thank you for agreeing to support research in the area of business sustainability. This research is part of the Network for Business Sustainability's embedding sustainability project hosted at Simon Fraser University in Canada.

This survey has been designed by Andrea Ferry, a Masters student at the University of Cape Town. This research has been approved by the Commerce Faculty Ethics in Research Committee at the University of Cape Town in South Africa.

Your participation is voluntary. If you choose to participate, you may still choose to withdraw from the study without giving a reason and without prejudice. We are only interested in aggregate data. You will not be identified by name. We cannot, however, guarantee confidentiality due to the inherent risks associated with the electronic transfer of information.

We are developing a survey instrument to help companies understand the extent to which employees are willing to engage in activities that help an organization deliver on its sustainability commitments. These commitments usually include the protection of the natural environment, the promotion of healthy communities, and following appropriate business governance practices.

There are 4 sections focused on: 1) demographics, 2) your work and sustainability 3) yourself at work and 4) yourself in general.

Please answer ALL the questions. It should not take more than 10 minutes to complete. Your answers will be kept strictly confidential and you will not be identified by name.

Your participation is voluntary. If you choose to participate, you may still choose to withdraw from the study without giving a reason and without prejudice.

- I agree to participate in this survey  
 I do not agree to participate in this survey

#### Demographics

## D2: Promotional document



### **SUSTAINABILITY EFFICACY SURVEY: *MEASURING YOUR ORGANISATION'S ABILITY TO BECOME SUSTAINABLE***

The Sustainability Efficacy Survey is a rigorously validated electronic survey which measures the belief your employees have in their ability to be part of the sustainable change journey of your organisation.

#### **Survey applications:**

- ✓ Provides a numeric reading of how deeply employees, (and the organisation as a whole), believe they can make sustainable changes at work.
- ✓ Can be used before and after sustainability programmes, or year on year, to provide an ongoing measure of progress.
- ✓ Identifies areas of resistance to change, enabling focussed interventions.
- ✓ Identifies areas of high propensity to change, enabling identification of champions.
- ✓ Simple to use: electronically managed and should take on average 15 minutes of your employees' time to complete.
- ✓ Can be combined with other surveys, such as employee engagement surveys.

#### **Contact details:**

For more information contact the researcher Andrea Ferry on 079 514 2771 or [andreaferry@gmail.com](mailto:andreaferry@gmail.com)

#### **Researcher Profile:**



Andrea is a Masters student at UCT Graduate School of Business, studying organisational cultural change for sustainability.

For this research Andrea is working closely with a team from Beedie Business School, Simon Fraser University in Vancouver, Canada. Andrea is co-supervised by Professor Stephanie Bertels, a highly respected academic and consultant. Stephanie studies how organizations make the transition towards sustainability by undertaking practitioner informed research on sustainable operations, embedding sustainability and sustainable innovation.

Andrea started her career as a chartered accountant, and worked in the UK, Australia and Tanzania, eventually settling back in her home town of Cape Town. In 2010, she embarked on an Honours degree in Sustainability Development at the Sustainability Institute of Stellenbosch University from which she graduated *cum laude* in 2011. Thereafter, Andrea took on a voluntary role as Sustainability Coordinator for her employer at the time. She resigned early 2014 to complete Masters full time. Andrea is a passionate advocate for sustainable change, but brings her corporate experience and pragmatism to bear on sustainability projects on which she works.

Click here for [Andrea's LinkedIn](#) profile

Click here for [Stephanie Bertels](#) profile

20 February 2015

### D3. Introductory email to Finco respondents

**From:** MarketIntelligence  
**Sent:** 19 June 2015 10:17 AM  
**To:**  
**Subject:** Sustainability Survey

Dear

Being sustainable is a business approach that drives long-term corporate growth through proper consideration of environmental and social impacts and good governance practices in order to create a fair and peaceful world for all, including our children.

The aim of this survey is to gain a sense of employees' sustainability beliefs in the workplace. Your participation in this research is voluntary. You can choose to withdraw from the research at any time. The questionnaire will take approximately 10 minutes to complete. All responses will be confidential and used for the purposes of this research only.

[Click here](#) to complete the survey.

Kind regards

Market Intelligence

## APPENDIX E: Phase 4 SES and CES exploratory results

Demographic variables collected included: Age Bracket, Race, Gender, Tenure Bracket, Job Grade and Business Unit.

Respondents spread across the full range of Age Bracket as follows:

Age B	Response spread
18-24 yrs	4%
25-34 yrs	32%
35-44 yrs	31%
45-54 yrs	25%
55-64 yrs	6%
Not indicated	2%

Gender was in a 40:58 male: female ratio, with 2 % not having indicated.

Race was indicated as follows:

Race	Response spread
Black	18%
Indian	10%
White	38%
Coloured <sup>11</sup>	30%
Other/ Blank	4%

Years of tenure with the company ranged as follows:

Tenure	Response spread
Less than 1yr	8%
1 – 3yrs	20%
3 – 7yrs	21%
7 – 15yrs	23%
15yrs+	26%
Not indicated	2%

Job Grade representation as follows, predominantly in the middle 5 categories. Grades 1 and 2 being the most senior levels were not surveyed.

---

<sup>11</sup>Please note, the term 'Coloured' is not considered derogatory in South Africa and is an accepted standard demographic category for race in HR.

Job Grade	Response spread
3	0%
4	2%
5	4%
6	5%
7	<b>16%</b>
8	<b>19%</b>
9	<b>11%</b>
10	<b>24%</b>
11	<b>14%</b>
12	4%
13	1%
14	0%
15	0%

### Data interpretation

Exploratory graphs and indications of scores prepared on a high level basis follow.

Scoring was set at 1 being the lowest score "Strongly Disagree", up to 7 as the highest score "Strongly Agree". SES items all scored on the positive side of the scale scoring between 5.8 and 6.1, in the "Somewhat Agree" to "Agree" range. CES items scores ranged between 5.5 and 6.2, also in the "Somewhat Agree" to "Agree" range.

The variables of Job Grade, Tenure and Department were the focus of the results as designing programmes in the workplace on the other demographics: Race, Gender or Age, is considered sensitive and unethical. However the results of these demographics will be included for interest.

Efficacy for Sustainability appears strong for newer employees, with a lift again for those with the longest tenure.

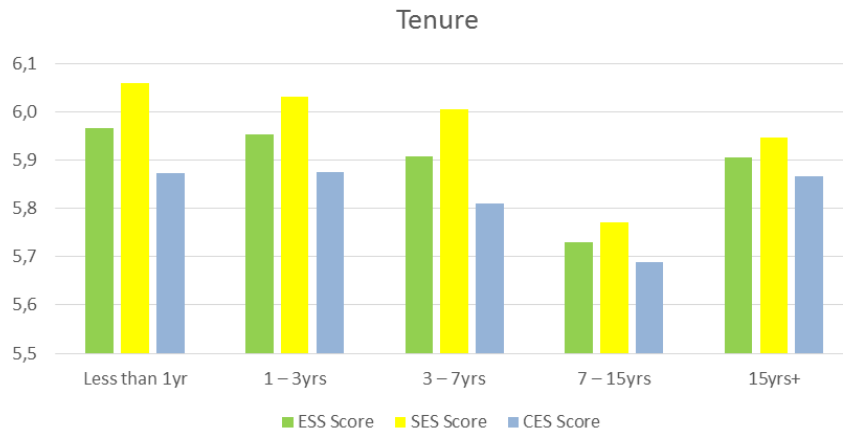


Fig E.1 Efficacy for Sustainability per Tenure

Management were advised to examine the possible reasons for the lower scores in the 7-15 year tenure group. During a discussion of this result management conceded that newer employees were the subject of greater exposure to sustainability messaging and programmes (e.g. in induction). We discussed it might be an idea to ensure a better spread of messaging across all tenure groups.

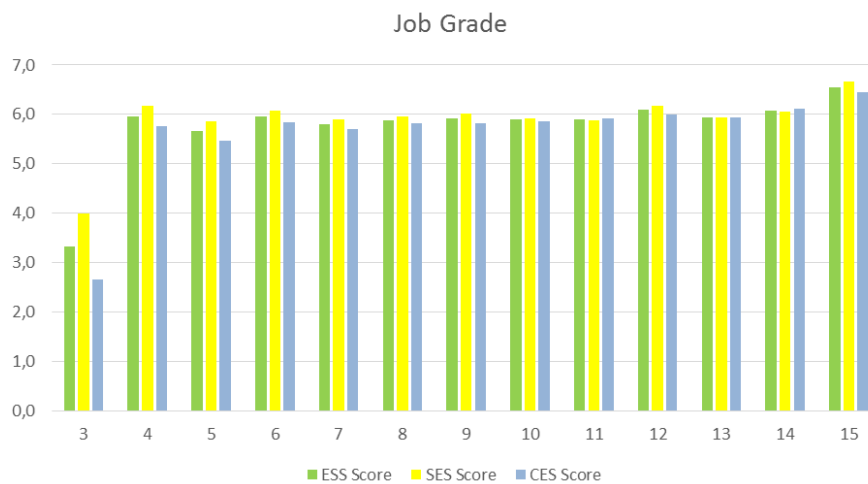


Fig E.2 Efficacy for Sustainability per Job Grade

Job grades does not appear to have much variance. Category 3 and 15 can be disregarded as the number of respondents in each numbered only 1.

For anonymity, business departments were numbered, rather than named. It is interesting to note the intra-department differences between self- and collective efficacy. See depts. 7, 20 and 22. In all but two cases, (7 and 22), self-efficacy for sustainability is stronger than collective efficacy. This could indicate that there is untapped potential among individuals to embed sustainability. As discussed in the literature, individuals with high self-efficacy, but in low collective efficacy environments are less likely to act on their capabilities.

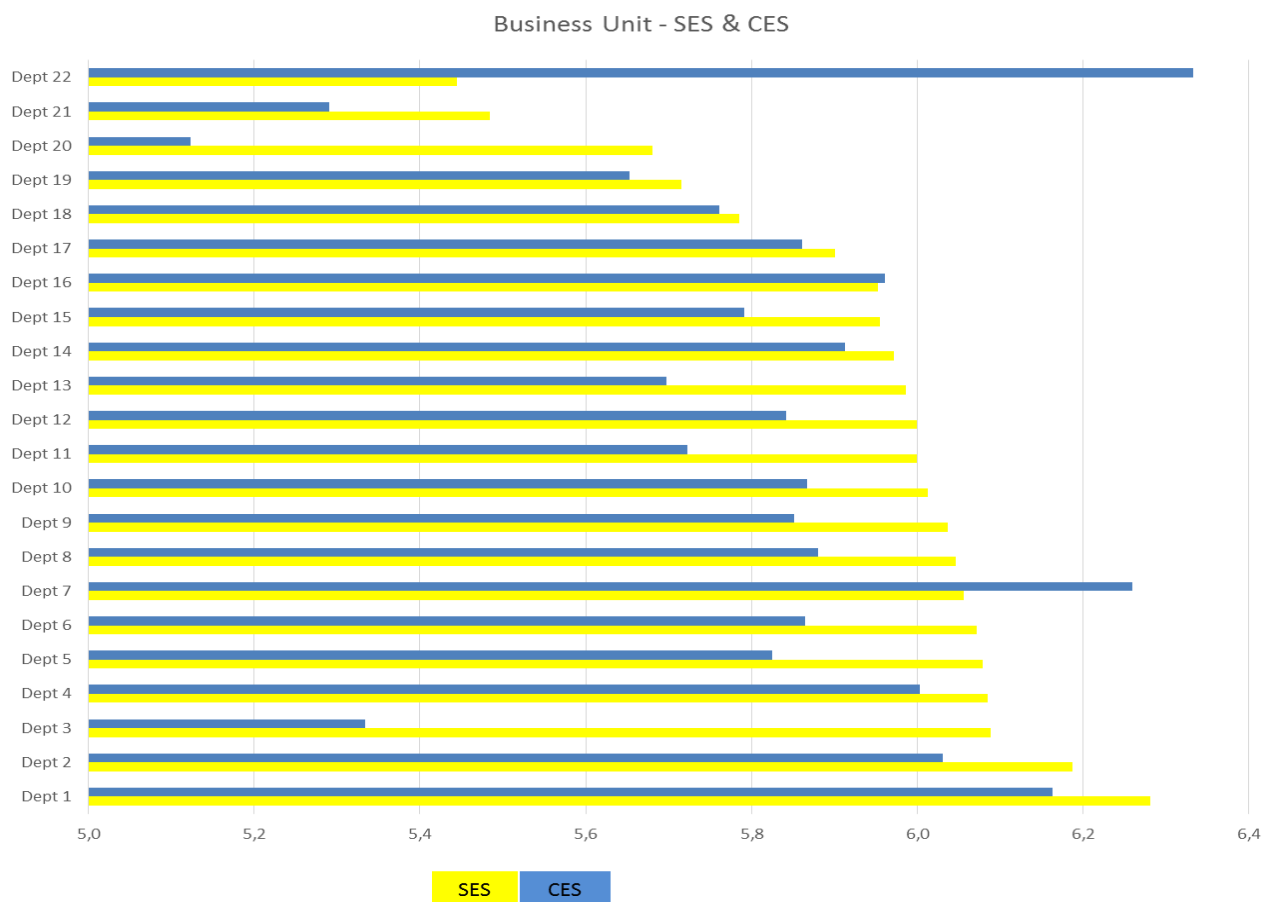


Fig E.3 Efficacy for Sustainability per Department

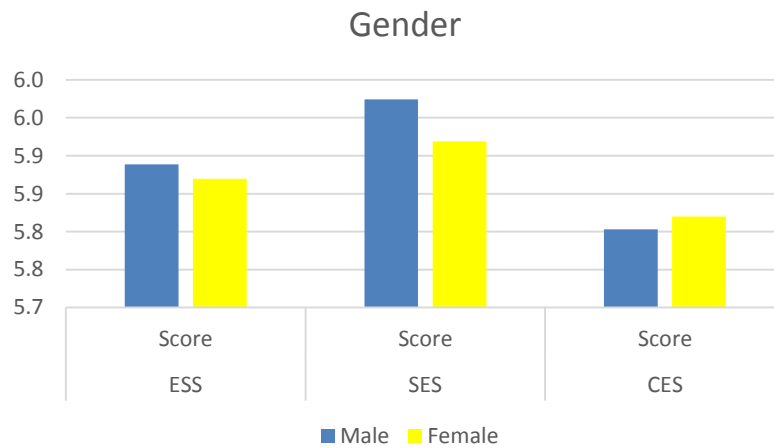


Fig E.4 Efficacy for Sustainability by Gender

The gender graph shows slightly higher self-efficacy among the male population. This is not all that surprising as according to Gecas (1989) research in sociology and child development shows that in our society males have a greater sense of self-efficacy, personal control, and mastery than females. Interestingly the female respondents showed a marginally stronger belief in the collective efficacy of the company.

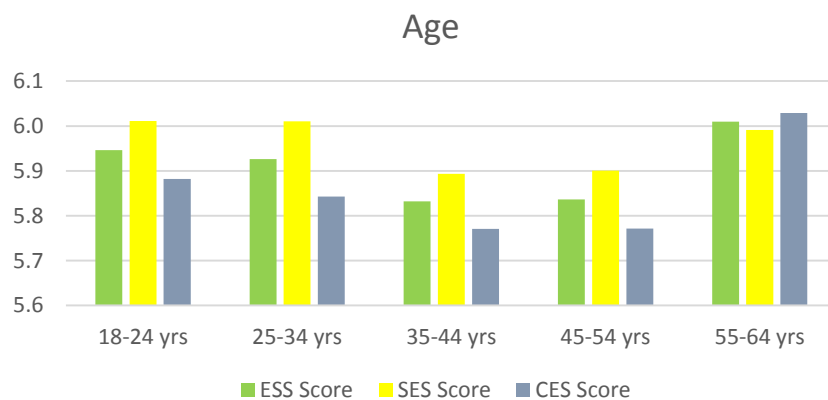


Fig E.5 Efficacy for Sustainability by Age Bracket

Age appears to follow the tenure pattern. Going against the overall trend of self- being stronger than collective efficacy, the older age group has a marginally stronger collective to self- efficacy.

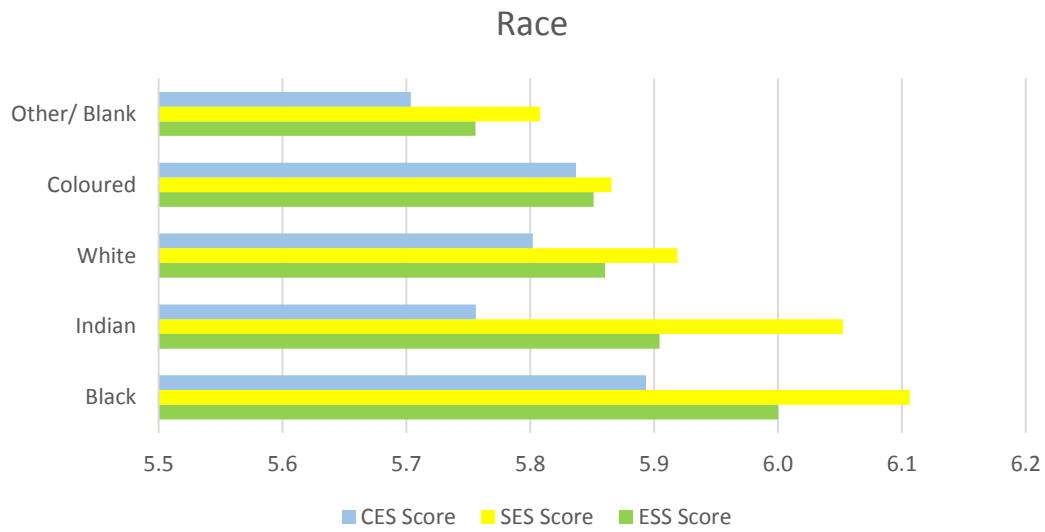


Fig E.6 Efficacy for Sustainability by Race

Race: Black and Indian respondents appear to have the largest differentials between self- and collective efficacy, with less of a belief in the ability of colleagues to embed sustainability successfully.

These graphs are exploratory in nature and further investigation was required to draw conclusive evidence for any statistical relationships.

## APPENDIX F: Phase 4 Individual item scores

SES Items	Score
I am confident that I can change the way I work so that my company is more sustainable.	5,9
I am confident that I can make changes to the way that I work which will support my company's sustainability goals.	5,9
I am confident that I can be a part of making this company more sustainable.	6,1
I am confident that in making decisions at work, I am able to take into account the environment, society, legislation and good business practice.	6,0
I am confident that I can make suggestions to my colleagues on ways they can be more sustainable at work.	5,8
I am confident that I can explain how sustainability relates to my own work.	5,8
I am confident that I can remain positive about supporting my company's sustainability goals.	6,1
Even in the face of challenges, I can still do my work in a way that supports my company's sustainability goals.	6,0
Even when others do not support me in my sustainability efforts, I still persevere.	5,9

CES Items	Score
People in my company are able to successfully address difficult and complex sustainability issues.	5.9
Because we work together, I am optimistic my company can improve its impact on creating a more sustainable environment.	5.9
By working together my company can be a sustainability leader in our industry.	5,0
As a company, we strive to reach our sustainability goals even when times are tough.	5,5
Even if my company is having a tough financial year, staff still strive to make a positive impact on environment, society, legislation and good business practice challenges facing us.	4,5
When financial and human resources are limited, sustainability stays a priority for this organisation.	4,5
My organisation has a strong vision for sustainability.	6,0
The staff in my company have a strong commitment to making this organisation more sustainable.	4,5
The staff in my company know what needs to be done to make this organisation more sustainable.	5,0

## APPENDIX G: Qualtrics citation references

Quantitative statistical analysis performed with Qualtrics is cited in a number of professional and academic journals and books such as:

### Journals

- Albaum, G. S., & Smith, S. M. (2006). Handbook of Marketing Research. London, United Kingdom: Sage Publications. Byu.edu
- Brunson, K. W. (2008). Electronic Textbooks: An Empirical Study of Adoption Potential. The Liberty Business Review VI.1, 44–55, Works.bepress.com
- McClure, J. (2008) Journal of New Communications Research, Vol II, Issue 2. 1-116 Lulu.com
- Strutz, M.L. (2008). A Retrospective Study of Skills, Traits, Influences, and School Experiences of Talented Engineers. ASEE North Central Section Conference Ilin.asee.org
- University of North Carolina at Chapel Hill, Carolina Population Center (CPC), Measure Evaluation, September 2007, (57) p. (SR-07-39| USAID Cooperative Agreement No. GPO-A-00-03-00003-00), DB.jhuccp.org
- Zikmund and Babin: <http://www.amazon.com/Essentials-Marketing-Research-Qualtrics-Card/dp/1439047545>

### Books

- Churchill, Brown and Suter: Basic Marketing Research (with Qualtrics Printed Access Card), April 2009 Marketing Research Qualtrics Printed Access
- Feinberg, Kinnear and Taylor: Modern Marketing Research: Concepts, Methods, and Cases, February 2012 Modern Marketing Research Concepts
- Iacobucci: Marketing Research: Methodological Foundations, 2009 Marketing Research Methodological Foundations Qualtrics
- Malhotra: Basic Marketing Research, 2008 Basic Marketing Research Qualtrics Pkg

- Sue, V. M., & Ritter, L.A. (2007). Conducting Online Surveys. United States of America: Sage Publications
- Zikmund, Babin, Carr, Griffin: Business Research Methods, March 2012 Business Research Methods Qualtrics Printed

## APPENDIX H: Ethics Approvals for Phases 2 and 4

FULL COLOUR THINKING



Dr Stephanie Giamporcaro  
GSB Research Director  
T: +27 (0)21 406 1180  
E: stephanie.giamporcaro@gsb.uct.ac.za

GSB/COM/027/2014

Cape Town, 09 October 2014

Andrea Ferry  
University of Cape Town, Graduate School of Business  
[andreaferri@gmail.com](mailto:andreaferri@gmail.com)

Dear Andrea

**Re: Ethics Approval**

Thank you for submitting your ethical clearance application for your Research on "Organisational culture and corporate sustainability: developing a research tool to assess efficacy for sustainability."

This is to confirm that your application has been assessed by the GSB's Ethics in Research Committee according to the rules and norms of the University and Commerce Faculty, and that it has been approved.

Please note that if you make any substantial change in your research procedure that could affect the experiences of the participants, you must submit a revised protocol to the Committee for approval. We wish you all the best for your research.

Kind Regards

**Signed**

Dr Stephanie Giamporcaro  
Research Director  
FULL COLOUR THINKING



FULL COLOUR THINKING



Dr Stephanie Giamporcaro  
GSB Research Director  
T: +27 (0)21 406 1180  
E: Stephanie.giamporcaro@gsb.uct.ac.za

GSB/COM/005

Cape Town, 17 June 2015

**Andrea Ferry**  
University of Cape Town, Graduate School of Business  
[andreaerry@gmail.com](mailto:andreaerry@gmail.com)

Dear Andrea

**Re: Ethics Approval**

Thank you for submitting your ethical clearance application for your research on **“Organisational culture and corporate sustainability: developing a research tool to assess efficacy for sustainability” with 3 additional scales: Convergent and Divergent Scales and Development objective scale.**

This is to confirm that your application has been assessed by the GSB’s Ethics in Research Committee according to the rules and norms of the University and Commerce Faculty, and that it has been approved.

Please note that if you make any substantial change in your research procedure that could affect the experiences of the participants, you must submit a revised protocol to the Committee for approval.

We wish you all the best for your research.

Kind Regards

signature removed

Dr Stephanie Giamporcaro  
Research Director

FULL COLOUR THINKING



## APPENDIX I: Phase 5 Item Alignment Scores Table

#	Scale	Item	Total Quotes	Low Agreement	Neutral Response	High Agreement	Unidentifi ed / Unsupport ed	Alignment %
1a	SES	I am confident that I can change the way I work so that my organisation is more sustainable.	4					
1b	SES	I am confident that I can change the way I work so that my organisation is more sustainable.	9					
1	SES	1 total	<b>13</b>	2	0	11	0	100%
2a	SES	I am confident that I can be a part of making this organisation more sustainable.	6					
2b	SES	I am confident that I can be a part of making this organisation more sustainable.	12					
	SES	2 total	<b>18</b>	2	0	13	3	83%
3a	SES	I am confident that I can make suggestions to my colleagues on ways they can be more sustainable at work.	4					
3b	SES	I am confident that I can make suggestions to my colleagues on ways they can be more sustainable at work.	9					
	SES	3 total	<b>13</b>	2	0	8	3	77%
4a	CES	If they chose to do so, I am confident my colleagues have	6	1	0	4	1	83%

#	Scale	Item	Total Quotes	Low Agreement	Neutral Response	High Agreement	Unidentifie d / Unsupport ed	Alignment %
		the right capabilities to make this organization more sustainable						
4b	CES	The staff in my organisation know what needs to be done to make this organisation more sustainable.	10	5	0	0	5	50%
		4 total	<b>16</b>	6	0	4	6	63%
5a	SES	I am confident that I can remain positive about supporting my organisation's sustainability goals.	6					
5b	SES	I am confident that I can remain positive about supporting my organisation's sustainability goals.	9					
		<i>5 combined</i>	<b>15</b>	2	0	10	3	80%
6a	SES	Even when others do not support me in my sustainability efforts, I still persevere.	4					
6b	SES	Even when others do not support me in my sustainability efforts, I still persevere.	12					
	SES	6 total	<b>16</b>	1	0	13	2	88%
7a	CES	Because we work together, I am optimistic my organisation can improve its efforts to create a more sustainable world.	6					

#	Scale	Item	Total Quotes	Low Agreement	Neutral Response	High Agreement	Unidentifi ed / Unsupport ed	Alignment %
7b	CES	Because we work together, I am optimistic my organisation can improve its efforts to create a more sustainable world.	9					
		<i>7 combined</i>	<b>15</b>	2	0	5	8	47%
8a	CES	I am confident sustainability will remain a priority for my organization in the long term	4			4		
8b	CES	Even if my organisation is having a tough financial year, staff still strive to make a positive impact on environment, society, legislation and good business practice challenges facing us.	13	2	1	10		
		<i>8 combined</i>	<b>17</b>	2	1	14	0	100%
9a	CES	My organization has a clear vision for sustainability.	6					
9b	CES	My organization has a <b>strong</b> vision for sustainability.	11					
		<i>9 combined</i>	<b>17</b>	5	2	7	3	82%
10a	CES	My colleagues have a strong commitment to making this organization more sustainable	4	0	1	2	1	
10b	CES	The staff in my organisation have a strong commitment to making this organisation more sustainable.	9	4	4	1	0	

#	Scale	Item	Total Quotes	Low Agreement	Neutral Response	High Agreement	Unidentifi ed / Unsupport ed	Alignment %
10	CES	<i>10 combined</i>	<b>13</b>	4	5	3	1	92%
11	SES	I am confident that I can make changes to the way that I work which will support my organisation's sustainability goals.	13	0	1	8	4	69%
12	SES	I am confident that in making decisions at work, I am able to take into account the environment, society, legislation and good business practice.	11	4	1	6	0	100%
13	SES	I am confident that I can explain how sustainability relates to my own work.	10	0	1	5	4	60%
14	SES	Even in the face of challenges, I can still do my work in a way that supports my organisation's sustainability goals.	13	2	1	4	6	54%
15	CES	People in my company are able to successfully address difficult and complex sustainability issues.	11	4	3	2	2	82%
16	CES	By working together my organisation can be a sustainability leader in our industry.	10	2	0	5	3	70%
17	CES	As an organisation, we strive to reach our sustainability goals even when times are tough.	9	5	2	2	0	100%

#	Scale	Item	Total Quotes	Low Agreement	Neutral Response	High Agreement	Unidentifi ed / Unsupport ed	Alignment %
18	CES	When financial and human resources are limited, sustainability stays a priority for this organisation.	12	6	1	1	4	67%
			<b>242</b>	<b>51</b>	<b>18</b>	<b>121</b>	<b>52</b>	<b>79%</b>

## APPENDIX J: Interview invite to Finco employees

Finco

Dear Colleague

Sustainability defined for 2015 survey:

*"Being sustainable is a business approach that drives long-term corporate growth through proper consideration of environmental, social impacts, legislation and good business practices in order to create a fair and peaceful world for all, including our children"*

### WHY WE NEED YOUR INPUT?

During 2015, you were one of 800+ Finco staff who participated in the Finco Sustainability Survey. The intention of the survey was to measure how staff perceived sustainability and if understood how they how this connects to their work. We are pleased to report the results showed that Santam staff on average rated their own and their colleagues' sustainability-related perceptions to be high, scoring around 84%. However to ensure that we complete this process, we are required to examine what this means to you as an individual in more depth and how Santam can build stronger sustainability links in the business.

### HOW WERE YOU SELECTED?

To ensure that your response (through this interview process) remains anonymous to the interviewer (external partner) we used a randomizer programme, which selected 40 people, of which you were one. You will be allocated a code which will ensure that your response will remain completely anonymous and you will be referred to by the *Finco* NOT your real name.

*NOTE: The interviews are not for evaluating you or your team. Also the results will not be used in Santam performance management, nor will content of the interviews be shared with management.*

### INTERVIEW PROCESS

As mentioned above, you will be known by a code and your response sheet to the survey in 2015 will be handed to you in a sealed envelope at the interview. Andrea Ferry, a PhD researcher from UCT, will conduct a 30-minute interview with you to discuss your survey responses and the factors that may have informed your responses.

If you are willing to participate in this short interview process, please click on this [LINK](#) and select your 2 best available slots. Andrea will confirm one of these and then send a meeting invite to you directly.

Interview dates: Friday 17 June; Monday 20 June; or Wednesday 22 June.

Your input to this process will be invaluable, assisting not only Santam to learn more about integrating sustainability, but also to assist academic research in this field. We look forward to your input into this process and hope you find it valuable as well.

All the best

## APPENDIX K: Interview questions

#	Question	Rationale
1	What is your role? What are the kind of things you do every day at work?	Assessing interviewee's level of sustainability experience, and relate to their type of work
2	Can you tell me what you understand about sustainability, particularly in your work context?	Assessing interviewee's level of sustainability experience
3	Can you tell me about any personal interest in sustainability?	Getting to know interviewee's level of sustainability experience, values, and commitments.
4	If you think back to when you answered the survey, how easily were you able to understand the survey? What may have made it more or less difficult?	Opening question; understandability of survey
5	How did you relate to the sustainability definition that was given? Can you explain why you think this definition may be appropriate at Finco?	Opening question; understandability of survey
6	Did you click through and look at the extra info on various sustainability projects that was provided?	Opening question; ease of use of survey
7	Were you able to understand the questions easily?	Survey itself
8	Can you identify some of the harder questions and explain why you think they are harder?	Survey itself
9	Which questions did you find easier, and why?	Survey itself
10	What thoughts about your work and sustainability were prompted by the survey, if any?	General assessment
11	What would need to happen in order for you to mark your scores higher: for yourself? For the company?	Eff Source: enabling environment
12	What things make you think your manager/s demonstrate good sustainability practices at work?	Modelling - vicarious experience; enabling environment
13	Can you describe any situations where another employee has spoken to you about integrating sustainability at work, and it has made you amend your work practices?	Social persuasion; enabling environment

#	Question	Rationale
14	Can you describe any incidents where you observed someone going about their work in a more sustainable way, and this influenced your behavior?	Vicarious experience
15	What activities do you think would help you to feel even more confident in working in sustainable ways	Mastery; personal factors
16	When you think about having to work in this way, how do you feel?	Affective state; personal factors
17	When you think about having to change how your work in this way, how do you feel?	Affective state
18	What is your motivation to work sustainably?	Affective state: enabling environment
19	How did you come to feel as positive about sustainability at work as you have indicated in your survey?	General; past experiences
20	When you think about the task of <i>insert survey questions</i> , what goes through your mind?	Eff Judgement: Task assessment
21	Can you describe if you have done anything like <i>insert survey questions</i> before?	Eff Judgement: prior task experience
22	What about your work environment makes these tasks easier for you?	Eff Judgement: enabling environment
23	What about your work environment makes these tasks harder for you?	Eff Judgement: inhibiting environment
24	Do you think upper management is supportive of Finco employees thinking and working this way? What makes you think that your managers are supportive (or not) of working this way?	Eff Judgement: Perception of management focus; environmental conditions
25	Do you think communication about sustainability is effective at Finco? What makes you think this / not?	Eff Judgement: coherent communication on expectations of sustainability in the workplace
26	Do you feel you would know what to do next to be more sustainable at work? Do you have clear goals? Is there something you may have been thinking about but just haven't acted on yet?	Eff Judgement: concrete goals

#	Question	Rationale
27	How much do you feel it's under your control to change how you work? What makes you feel this way?	Eff Judgement: controllable/ uncontrollable
28	Can you describe times or situations where you feel it's not under your control to act sustainably when at work?	Eff Judgement: controllable/ uncontrollable
29	Have there been times when you have felt confident you could do these type of things and then others when not? What do you think was the difference between these times?	Eff Judgement: stable/unstable
30	When you look at the questions on this survey, what emotions do they bring up in you, if any?	Self-assessment: affective state; mood
31	What knowledge / skills do you think you would need to be able to answer these questions "strongly agree"? OR If you answered "Strongly Agree", what skills / knowledge were you thinking of applying here?	Self-assessment: skills, knowledge
32	Do you feel more or less energized when you read this/ these questions? Why?	Self-assessment: avail energy (effort)
33	Can you describe how you go, or could go, about your work in a more sustainable way?	SIB: mastery
34	What past experiences enabled you to answer positively in the survey?	SIB: mastery
35	When you were answering these questions, what activities were you thinking about?	SIB: mastery
36	How dependent on others do you feel in order for you to work sustainably? Can you explain why you feel this way?	Task interdependency
37	The general scores showed a stronger result for how an individual felt about themselves, rather than how individuals felt about others in the company. What factors do you think might have fed into this result?	SES vs CES
38	Tell me about any other things I, as an outsider, might want to know about sustainability at Finco?	Closing question
39	Do you have any questions for me on this research/ or our interview?	Closing question

## **APPENDIX L: Advice for the Practical Application of the Scales**

The following section describes how a researcher or practitioner could apply the scales in a live working environment.

### **Introducing the concept to decision makers**

I propose that this survey would be of greatest interest to the HR and sustainability departments of an organisation. An edited version of the introduction document can be used to introduce the relevant manager to the survey (see Appendix C). The organisation's contact person should assign an internal sponsor, and someone to assist with the logistics of permissions, contextualising text, and circulation to employees.

### **Modifying the scale for context**

The surveys can be created in any commonly used survey software. SES and CES Items can be integrated with existing ones, such as staff engagement surveys. The appropriateness and understandability of the wording of the introductory sections and the items should be reviewed within the context of the particular company in which the scales will be utilised. For example, at Finco I used the word 'company' rather than 'organisation' as that is the terminology Finco employees would mostly use in reference to their organisation.

The definition of business sustainability in the introduction should ideally be modified in line with the organisation's definition. If the organisation has no specific definition a generic version can be used, for example:

*"a business approach that explicitly acknowledges the need to take into account broader environmental and social factors over longer time frames, resulting in a broader understanding of value creation."*

The survey is a good opportunity to communicate the organisation's sustainability ethos and programmes. A click-through page which contains this information could be included.

Organisational branding should be applied to the opening email and the scales themselves. This professionalises the survey and employees are more likely to take the scale seriously than if appearing to come from a random source. An email with survey link should be sent from a senior leader to increase the gravitas of the exercise. The details of an internal contact person should be made available for any questions.

### **Obtaining responses**

The timing of sending the survey should be assessed against the corporate calendar. It is preferable that the survey is not sent during significant leave periods, or in particularly busy times such as financial year ends or during the budgeting process. It is also preferable that it does not come shortly after other organisational surveys.

The length of the survey can affect obtaining quality responses. This should be discussed with management who can advise on employees' appetite for length of survey. There is an option to use the 10 or 18 items survey. Both will result in solid data on SES and CES of employees, although the 18 item survey will provide greater nuance to areas of strong or weak sense of SES and CES.

To encourage honest answers, one should include the reason for the survey, the nature and timing of feedback, and reassurances of confidentiality. After completing the survey employees should be thanked for participating.

## **Analysing and reporting results**

### Data management

The survey data will be available in reports from whichever survey software was utilised, and the raw data can be exported results to Microsoft Excel facilitating further analysis.

Data should be cleaned for respondents who have appeared to give straight-line answers, or have taken too little time to respond. Software survey provides the time taken per respondent and thus the average time can be calculated. It is up to the analysts to decide a sensible cut-off time. Records of responses eliminated should be kept so as to enable one to reconcile the completeness of data as one proceeds with analyses.

The initial reports should be analysed for a good spread of departments and other demographic factors. For example, it would be misleading to report on department comparisons where the percentage of respondents per department differ vastly in numbers. These data characteristics can be noted when results are presented to qualify results that could otherwise be misleading.

### Feedback to management and respondents

Discussing management's objectives for running the SES and CES surveys should provide guidance on how they would prefer the results presented, and in how much detail.

Basic information should include the number of respondents surveyed, the number of responses received, and the average scores across the population for SES and CES. The average SES and CES scores can be calculated by summing item scores per individual respondent, dividing that number by the number of items, and then averaging that calculated figure for all respondents. Individual item average scores can also prove interesting, showing particular areas of weakness or strength. For example in Finco the following item: "Because we work together, I am optimistic my company can improve its

impact on creating a more sustainable environment” scored an average of 3.5 points, placing it between *Somewhat Disagree* and *Neutral*, indicating limited belief in the strength of working together to achieve sustainability.

The difference in the average score between SES and CES can also prove interesting. One generally expects SES to be stronger, as respondents feel more comfortable reporting on themselves than on others, however there may well be organisations where the scores show a greater CES than SES. Either result should be investigated further as having them as close as possible is preferable. If individuals report lower CES to SES the risk is that those individuals will not fully utilise their full SES potential as they believe their efforts will be diluted by those around them who are less capable. On the other hand if individuals report stronger CES than SES it may indicate there is untapped potential in those individuals.

An organisation with greater SES than CES could work on better communications on sustainability thus letting employees know what others in the organisation are accomplishing, breaking down silos and promoting team work. Scoring greater CES than SES could indicate work is needed on individual mentoring, training and personal development to improve employees’ SES. This analysis can also be broken down per department to provide a more nuanced view, and identify the potential focus areas for applying different programmes to specific departments.

It is also helpful to show the SES and CES scores for each demographic factor that was included in the information gathering as graphics. I created a report with a series of graphs to show these results. An example is represented below.

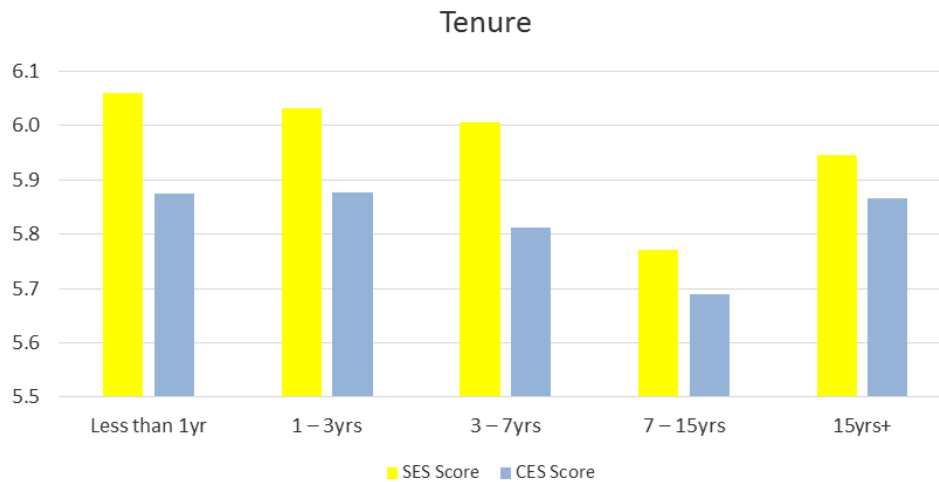


Fig L.7 Graphical representation of Finco’s SES and CES per Tenure Group

By discussing the results with management, one can acquire insights into the scores. For example a specific department may recently have had sustainability training, hence reflecting greater scores for SES and/or CES than other departments. By including free-form questions as to why the respondent has scored a specific items the way he has, relevant quotes can be drawn out and included as illustrations to support these insights. These details should be incorporated into the final report.

I recommend management provides a brief feedback of survey results to employees. This can be as brief as the high level scores for SES and CES, but it would be more interesting to include some of the results for the various demographic indicators. Management’s intentions for addressing areas of SES and CES weakness, or supporting areas of strengths can be including in this communication. Feedback should happen as soon as possible after the survey.

## APPENDIX M: Phase 2 Descriptive statistics

### Statistics

		Employment Status	Employment Type	Industry Sector	Age Bracket	Race
N	Valid	292	281	292	281	281
	Missing	0	11	0	11	11

### Statistics

		Race_other	Gender
N	Valid	292	281
	Missing	0	11

## Frequency Table

### Employment Status

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Full - time Employed	292	100.0	100.0	100.0

### Employment Type

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Hourly / Non Salaried Employee	84	28.8	29.9	29.9
	Salaried Employee	126	43.2	44.8	74.7
	First Line Manager / Supervisor	17	5.8	6.0	80.8
	Mid Level Manager	25	8.6	8.9	89.7
	Senior Manager	19	6.5	6.8	96.4
	Other	10	3.4	3.6	100.0
	Total		281	96.2	100.0
Missing	System	11	3.8		
Total		292	100.0		

### Age Bracket

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 - 24	17	5.8	6.0	6.0
	25 - 34	87	29.8	31.0	37.0
	35 - 44	66	22.6	23.5	60.5
	45 - 55	59	20.2	21.0	81.5
	Over 55	52	17.8	18.5	100.0
	Total	281	96.2	100.0	
Missing	System	11	3.8		
Total		292	100.0		

### Race

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	White	212	72.6	75.4	75.4
	Asian	17	5.8	6.0	81.5
	American Indian / Alaska Native	4	1.4	1.4	82.9
	4	2	.7	.7	83.6
	9	2	.7	.7	84.3
	Black / African America	27	9.2	9.6	94.0
	Other	3	1.0	1.1	95.0
	Prefer not to disclose	4	1.4	1.4	96.4
	Native Hawaiian / Other Pacific Islander	2	.7	.7	97.2
	Hispanic / Latino	8	2.7	2.8	100.0
	Total	281	96.2	100.0	
	Missing	System	11	3.8	
Total		292	100.0		

### Race\_other

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	292	100.0	100.0	100.0

**Gender**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	130	44.5	46.3	46.3
	Female	148	50.7	52.7	98.9
	Other	1	.3	.4	99.3
	Prefer not to disclose	2	.7	.7	100.0
	Total	281	96.2	100.0	
Missing	System	11	3.8		
Total		292	100.0		

### Industry Sector

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid	6	2.1	2.1	2.1
Advertising	1	.3	.3	2.4
Agriculture	1	.3	.3	2.7
Banking	52	17.8	17.8	20.5
Business	2	.7	.7	21.2
Business Services	1	.3	.3	21.6
Chemical	1	.3	.3	21.9
Child Care	1	.3	.3	22.3
Cleaning	1	.3	.3	22.6
comercitibly	1	.3	.3	22.9
Commuter	1	.3	.3	23.3
Construction	3	1.0	1.0	24.3
Consulting	2	.7	.7	25.0
Darden	1	.3	.3	25.3
Data	1	.3	.3	25.7
E-commerce	1	.3	.3	26.0
Education	18	6.2	6.2	32.2
Electric/Gas & Utilities	1	.3	.3	32.5
Electrical	1	.3	.3	32.9
Electrical/Electronics Manufacturing	1	.3	.3	33.2
Fast Food	1	.3	.3	33.6
Finance	6	2.1	2.1	35.6
Fire department	1	.3	.3	36.0
Firm	1	.3	.3	36.3
Food Manufacturing	1	.3	.3	36.6
Food Service	1	.3	.3	37.0
Forestry	1	.3	.3	37.3
Gaming	1	.3	.3	37.7
general manager	1	.3	.3	38.0
Government	9	3.1	3.1	41.1
Health Care	29	9.9	9.9	51.0
High Tech	1	.3	.3	51.4
home	1	.3	.3	51.7
Home preservation	1	.3	.3	52.1

Data 1

**Industry Sector**

	Frequency	Percent	Valid Percent	Cumulative Percent
Homecare Aide	1	.3	.3	52.4
Hotel	1	.3	.3	52.7
idontknow	1	.3	.3	53.1
Information Technology	1	.3	.3	53.4
Insurance	1	.3	.3	53.8
Interior Design	1	.3	.3	54.1
Interior Surfacing Material	1	.3	.3	54.5
Internet Security	1	.3	.3	54.8
Internet Services	1	.3	.3	55.1
Investment Research	25	8.6	8.6	63.7
IT	2	.7	.7	64.4
Law Enforcement	1	.3	.3	64.7
Library	1	.3	.3	65.1
Life Insurance	1	.3	.3	65.4
life sciences research	1	.3	.3	65.8
Local Government	1	.3	.3	66.1
Locksmith	1	.3	.3	66.4
Management	1	.3	.3	66.8
manager	1	.3	.3	67.1
Manufacturing	8	2.7	2.7	69.9
Medical	3	1.0	1.0	70.9
Mining	20	6.8	6.8	77.7
Non-Profit	8	2.7	2.7	80.5
none ya	1	.3	.3	80.8
Oil and gas	1	.3	.3	81.2
Petroleum	1	.3	.3	81.5
Pharmaceutical Manufacturing	2	.7	.7	82.2
Postal Service	1	.3	.3	82.5
Printing	1	.3	.3	82.9
Professional Services	2	.7	.7	83.6
Professional Sports	1	.3	.3	83.9
Publishing	1	.3	.3	84.2
R&D	1	.3	.3	84.6
Real Estate	3	1.0	1.0	85.6

	Frequency	Percent	Valid Percent	Cumulative Percent
Recreation	1	.3	.3	86.0
Research	1	.3	.3	86.3
Restaurant	1	.3	.3	86.6
Retail	10	3.4	3.4	90.1
Retail Sales	2	.7	.7	90.8
Sales	1	.3	.3	91.1
Security	3	1.0	1.0	92.1
ship building	1	.3	.3	92.5
Social Services	2	.7	.7	93.2
Software	2	.7	.7	93.8
State Government	2	.7	.7	94.5
State of Georgia government	1	.3	.3	94.9
Taxes	1	.3	.3	95.2
Technology	4	1.4	1.4	96.6
Telecommunications	2	.7	.7	97.3
Tourism	1	.3	.3	97.6
Transportation	2	.7	.7	98.3
uhgetds	1	.3	.3	98.6
usaf	1	.3	.3	99.0
USPS	1	.3	.3	99.3
Wholesale	1	.3	.3	99.7
yuijk	1	.3	.3	100.0
Total	292	100.0	100.0	

### Descriptive Statistics

	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Deviation Statistic	Skewness Statistic
Employment Status	292	3	3	3.00	.000	.
Employment Type	281	1	6	2.28	1.349	1.239
Years at organization	281	0	53	8.60	8.157	2.039
Age Bracket	281	2	6	4.15	1.218	.129
Age in Years	281	20	76	41.30	12.568	.319
Race	281	1	16	2.87	4.089	2.059
Gender	281	1	4	1.56	.546	.510
Valid N (listwise)	281					

### Descriptive Statistics

	Skewness	Kurtosis	
	Std. Error	Statistic	Std. Error
Employment Status	.	.	.
Employment Type	.145	.706	.290
Years at organization	.145	5.422	.290
Age Bracket	.145	-1.120	.290
Age in Years	.145	-.936	.290
Race	.145	2.828	.290
Gender	.145	.832	.290
Valid N (listwise)			

## APPENDIX N: List of Scale Items assessed during SES and CES item generation

#	Possible Item	Related theme	Source
1	1. People in this organization can take on any challenge.	Organisational efficacy	Bohn, 2010
2	2. Because our departments work together well, this organization can beat our competition.	Organisational efficacy	Bohn, 2010
3	3. This organization is more innovative than most organizations I have worked in.	Organisational efficacy	Bohn, 2010
4	4. In this organization, we can coordinate our efforts to complete difficult projects.	Organisational efficacy	Bohn, 2010
5	5. People in this organization can work together to accomplish a goal.	Organisational efficacy	Bohn, 2010
6	7. People in this organization can mobilize efforts to accomplish difficult and complex goals.	Organisational efficacy	Bohn, 2010
7	10. In this organization, everyone works together effectively.	Organisational efficacy	Bohn, 2010
8	13. This organization can meet customer requirements because the employees are extremely competent.	Organisational efficacy	Bohn, 2010
9	15. People here have a sense of purpose to accomplish something.	Organisational efficacy	Bohn, 2010
10	17. This company has a strong vision.	Organisational efficacy	Bohn, 2010
11	22. This organization is confident about its future.	Organisational efficacy	Bohn, 2010
12	27. This organization will double in size in the next 10 years.	Organisational efficacy	Bohn, 2010
13	28. During the coming economic downturn, this organization will come out strong.	Organisational efficacy	Bohn, 2010
14	30. This organization is likely to fall apart in a few years. (R)	Organisational efficacy	Bohn, 2010
15	32. This organization has no hope of surviving more than a year or two. (R)	Organisational efficacy	Bohn, 2010
16	34. I would be surprised if this organization exists in 5 years. (R)	Organisational efficacy	Bohn, 2010
17	35. Since this organization is likely to fail, I would never recommend that a friend take a job here. (R)	Organisational efficacy	Bohn, 2010
18	1. I can always manage to solve difficult problems if I try hard enough.	General self-efficacy	Shwarzer & Jerusalem, 1995

#	Possible Item	Related theme	Source
19	2. If someone opposes me, I can find the means and ways to get what I want.	General self-efficacy	Shwarzer & Jerusalem, 1995
20	3. It is easy for me to stick to my aims and accomplish my goals.	General self-efficacy	Shwarzer & Jerusalem, 1995
21	4. I am confident that I could deal efficiently with unexpected events.	General self-efficacy	Shwarzer & Jerusalem, 1995
22	5. Thanks to my resourcefulness, I know how to handle unforeseen situations.	General self-efficacy	Shwarzer & Jerusalem, 1995
23	6. I can solve most problems if I invest the necessary effort.	General self-efficacy	Shwarzer & Jerusalem, 1995
24	7. I can remain calm when facing difficulties because I can rely on my coping abilities.	General self-efficacy	Shwarzer & Jerusalem, 1995
25	8. When I am confronted with a problem, I can usually find several solutions.	General self-efficacy	Shwarzer & Jerusalem, 1995
26	9. If I am in trouble, I can usually think of a solution.	General self-efficacy	Shwarzer & Jerusalem, 1995
27	10. I can usually handle whatever comes my way	General self-efficacy	Shwarzer & Jerusalem, 1995
28	My new job is well within the scope of my abilities.	Socialization Tactics, Self-Efficacy, and Newcomers' Adjustments to Organizations	Jones, 1986
29	I do not anticipate any problems in adjusting to work in this organization.	Socialization Tactics, Self-Efficacy, and Newcomers' Adjustments to Organizations	Jones, 1986
30	I feel I am overqualified for the job I will be doing.	Socialization Tactics, Self-Efficacy, and Newcomers' Adjustments to Organizations	Jones, 1986
31	I have all the technical knowledge I need to deal with my new job, all I need now is practical experience.	Socialization Tactics, Self-Efficacy, and Newcomers' Adjustments to Organizations	Jones, 1986
32	I feel confident that my skills and abilities equal or exceed those of my future colleagues.	Socialization Tactics, Self-Efficacy, and Newcomers' Adjustments to Organizations	Jones, 1986
33	My past experiences and accomplishments increase my confidence that I will be able to perform successfully in this organization.	Socialization Tactics, Self-Efficacy, and Newcomers' Adjustments to Organizations	Jones, 1986
34	I could have handled a more challenging job than the one I will be doing.	Socialization Tactics, Self-Efficacy, and Newcomers' Adjustments to Organizations	Jones, 1986

#	Possible Item	Related theme	Source
35	Professionally speaking, my new job exactly satisfies my expectations of myself. (R)	Socialization Tactics, Self-Efficacy, and Newcomers' Adjustments to Organizations	Jones, 1986
36	I drove, escorted, or entertained company guests, clients, or out-of-town employees.	Organizational citizenship behavior	Fox, Spector, Goh, Bruursema, & Kessler, 2009
37	Helped co-worker learn new skills or shared job knowledge.	Organizational citizenship behavior	Fox, Spector, Goh, Bruursema, & Kessler, 2009
38	Helped new employees get oriented to the job.	Organizational citizenship behavior	Fox, Spector, Goh, Bruursema, & Kessler, 2009
39	Used own vehicle, supplies or equipment for employer's business.	Organizational citizenship behavior	Fox, Spector, Goh, Bruursema, & Kessler, 2009
40	Offered suggestions to improve how work is done.	Organizational citizenship behavior	Fox, Spector, Goh, Bruursema, & Kessler, 2009
41	Offered suggestions for improving the work environment.	Organizational citizenship behavior	Fox, Spector, Goh, Bruursema, & Kessler, 2009
42	Came in early or stayed late without pay to complete a project or task.	Organizational citizenship behavior	Fox, Spector, Goh, Bruursema, & Kessler, 2009
43	Volunteered for extra work assignments.	Organizational citizenship behavior	Fox, Spector, Goh, Bruursema, & Kessler, 2009
44	Tried to recruit a person to work for your employer	Organizational citizenship behavior	Fox, Spector, Goh, Bruursema, & Kessler, 2009
45	Worked weekends or other days off to complete a project or task.	Organizational citizenship behavior	Fox, Spector, Goh, Bruursema, & Kessler, 2009
46	Brought work home to prepare for next day.	Organizational citizenship behavior	Fox, Spector, Goh, Bruursema, & Kessler, 2009
47	Volunteered to attend meetings or work on committees on own time.	Organizational citizenship behavior	Fox, Spector, Goh, Bruursema, & Kessler, 2009
48	Said good things about your employer in front of others.	Organizational citizenship behavior	Fox, Spector, Goh, Bruursema, & Kessler, 2009
49	Gave up meal and other breaks to complete work.	Organizational citizenship behavior	Fox, Spector, Goh, Bruursema, & Kessler, 2009

#	Possible Item	Related theme	Source
50	Volunteered to work at after-hours or out-of-town events.	Organizational citizenship behavior	Fox, Spector, Goh, Bruursema, & Kessler, 2009
51	I can have a positive impact on the world's social problems through the work I do.	Self-efficacy toward service	Self-generated, modified from Weber, Weber, Sleeper & Schneider, 2011
52	I can have a positive impact on the world's environmental problems through the work I do.	Self-efficacy toward service	Self-generated, modified from Weber, Weber, Sleeper & Schneider, 2011
53	At work, each of us can make a difference in the lives of the less fortunate.	Self-efficacy toward service	Self-generated, modified from Weber, Weber, Sleeper & Schneider, 2011
54	At work, I can help people to understand how to perform their jobs in a more environmentally and socially sustainable way.	Self-efficacy toward service	Self-generated, modified from Weber, Weber, Sleeper & Schneider, 2011
55	I have confidence in my ability to help others understand how to be more environmentally friendly.	Self-efficacy toward service	Self-generated, modified from Weber, Weber, Sleeper & Schneider, 2011
56	1. I can always manage to solve difficulties in how to do my role in a more sustainable manner if I try hard enough.	General self-efficacy	Self-generated, modified from Shwarzer & Jerusalem, 1995
57	2. If someone opposes me on how to do my job in a more sustainable manner, I can find the ways means to follow through on what I want.	General self-efficacy	Self-generated, modified from Shwarzer & Jerusalem, 1995
58	3. At work, it is easy for me to stick to my sustainability aims and accomplish my sustainability goals.	General self-efficacy	Self-generated, modified from Shwarzer & Jerusalem, 1995
59	4. I am confident that I could deal efficiently with unexpected events that challenge my ability to do my role on a sustainable manner.	General self-efficacy	Self-generated, modified from Shwarzer & Jerusalem, 1995
60	5. Thanks to my resourcefulness, I know how to handle unforeseen situations that may hinder my ability to behave in a sustainable way	General self-efficacy	Self-generated, modified from Shwarzer & Jerusalem, 1995
61	6. At work, I can solve most problems on how to be more sustainable, if I invest the necessary effort.	General self-efficacy	Self-generated, modified from Shwarzer & Jerusalem, 1995

#	Possible Item	Related theme	Source
62	7. I can remain calm when facing difficulties in doing my job in a sustainable manner, because I can rely on my coping abilities.	General self-efficacy	Self-generated, modified from Shwarzer & Jerusalem, 1995
63	8. When I am confronted with a problem on how to be more sustainable, I can usually find several solutions.	General self-efficacy	Self-generated, modified from Shwarzer & Jerusalem, 1995
64	9. <i>If I am in trouble, I can usually think of a solution.</i>	General self-efficacy	Self-generated, modified from Shwarzer & Jerusalem, 1995
65	10. I can usually handle whatever sustainability challenges come my way.	General self-efficacy	Self-generated, modified from Shwarzer & Jerusalem, 1995
66	I don't let tough sustainability problems keep me down	Self-efficacy beliefs of adolescents	Self-generated, modified from Bandura, 2006
67	I bounce back after I have tried my best and failed to achieve sustainable result at work	Self-efficacy beliefs of adolescents	Self-generated, modified from Bandura, 2006
68	I keep trying when things are going really badly regarding sustainability at work	Self-efficacy beliefs of adolescents	Self-generated, modified from Bandura, 2006
69	I can keep up my spirits when I suffer hardships as a result of trying to be more environmentally and socially conscious at work	Self-efficacy beliefs of adolescents	Self-generated, modified from Bandura, 2006
70	I manage to get rid of self-doubts after I have had tough setbacks in pursuing my sustainability goals	Self-efficacy beliefs of adolescents	Self-generated, modified from Bandura, 2006
71	I keep from being easily rattled when being an activist for sustainability at work	Self-efficacy beliefs of adolescents	Self-generated, modified from Bandura, 2006
72	I can overcome discouragement when nothing I try seems to work to spread sustainability	Self-efficacy beliefs of adolescents	Self-generated, modified from Bandura, 2006
73	I am very interested in my company's efforts to become sustainable.	Self-efficacy for sustainability	Self-generated
74	I am committed to supporting my companies sustainability strategy	Self-efficacy for sustainability	Self-generated
75	I have the ability to support our company's sustainability strategy whole heartedly	Self-efficacy for sustainability	Self-generated
76	I understand how the sustainability strategy applies to my job	Self-efficacy for sustainability	Self-generated

#	Possible Item	Related theme	Source
77	I have all the technical knowledge I need to deal with my new job, all I need now is practical experience.	Socialization Tactics, Self-Efficacy, and Newcomers' Adjustments to Organizations	Self-generated, modified from Jones, 1986
78	I am empowered to 'do the right thing' when it comes to looking after the environment.	Self-efficacy for sustainability	Self-generated
79	I can take time to ensure I have embedded sustainability into my daily tasks	Self-efficacy for sustainability	Self-generated
80	I am excited to try out new ways of working	Self-efficacy for sustainability	Self-generated
81	I can tell stories to colleagues about the successes AND failures of projects for sustainability	Self-efficacy for sustainability	Self-generated
82	I can understand most things in our company Integrated Report	Self-efficacy for sustainability	Self-generated
83	1. People in this organization can take on any sustainability challenge.	Organisational efficacy	Self-generated; modified from Bohn, 2010
84	2. Because our departments work together well, this organization can exceed the competition by becoming the most sustainable insurer	Organisational efficacy	Self-generated; modified from Bohn, 2010
85	5. People in this organization can work together to accomplish its sustainability goals.	Organisational efficacy	Self-generated; modified from Bohn, 2010
86	6. I think this organization should give up on trying to accomplish our sustainability goals because we don't work together very well in these areas. (R)	Organisational efficacy	Self-generated; modified from Bohn, 2010
87	7. People in this organization can mobilize efforts to accomplish difficult and complex sustainability goals.	Organisational efficacy	Self-generated; modified from Bohn, 2010
88	8. Every time this organization takes on a sustainability challenge we are confident of success.	Organisational efficacy	Self-generated; modified from Bohn, 2010
89	9. Many of the sustainability projects we are working on, such as xyz, intimidate our organization. (R)	Organisational efficacy	Self-generated; modified from Bohn, 2010
90	10. In this organization, everyone works together effectively on our sustainability goals.	Organisational efficacy	Self-generated; modified from Bohn, 2010
91	11. Few organizations are as strong as this one when it comes to sustainability	Organisational efficacy	Self-generated; modified from Bohn, 2010
92	15. People here have a sense of purpose to become more sustainable.	Organisational efficacy	Self-generated; modified from Bohn, 2010

#	Possible Item	Related theme	Source
93	16. People in this organization know where we are going in the future as far as sustainability is concerned	Organisational efficacy	Self-generated; modified from Bohn, 2010
94	17. This company has a strong vision for being the leader in sustainable insurance	Organisational efficacy	Self-generated; modified from Bohn, 2010
95	18. We are very certain about what we will accomplish in the area of sustainability together as a company.	Organisational efficacy	Self-generated; modified from Bohn, 2010
96	19. People in this organization are unsure of what they should do when it comes to taking action for sustainability	Organisational efficacy	Self-generated; modified from Bohn, 2010
97	20. This organization has no vision for a sustainable future (R)	Organisational efficacy	Self-generated; modified from Bohn, 2010
98	21. We can accomplish the sustainability goals of this organization with much effort.	Organisational efficacy	Self-generated; modified from Bohn, 2010
99	22. This organization is confident about its future as concerns sustainability	Organisational efficacy	Self-generated; modified from Bohn, 2010
100	24. There is no reason for us to persist in our sustainability goals. (R)	Organisational efficacy	Self-generated; modified from Bohn, 2010
101	25. Our ability to work together makes me very optimistic about the future of sustainability at this organization.	Organisational efficacy	Self-generated; modified from Bohn, 2010
102	29. As an organization, we are probably going down the wrong path to achieve sustainability.	Organisational efficacy	Self-generated; modified from Bohn, 2010
103	31. Since we cannot get our act together for creating a sustainable company, lots of people are likely to leave this company in a few years. (R)	Organisational efficacy	Self-generated; modified from Bohn, 2010
104	33. It would be better if we didn't take on some of our sustainability projects, since we are likely to fail. (R)	Organisational efficacy	Self-generated; modified from Bohn, 2010
105	Our leaders create a culture of sustainability through their actions	Collective efficacy for sustainability	Self-generated
106	My team can influence fellow employees in relation to positive changes.	Collective efficacy for sustainability	Self-generated
107	We are confident in delivering on our sustainability promises to our shareholders, government partners and regulators	Collective efficacy for sustainability	Self-generated
108	We can experiment with sustainability projects that do not always have a clear business case.	Collective efficacy for sustainability	Self-generated

#	Possible Item	Related theme	Source
109	We confidently 'walk the talk' when it comes to being environmentally friendly at work	Collective efficacy for sustainability	Self-generated
110	We are confident in innovating solutions for our own risk mitigation.	Collective efficacy for sustainability	Self-generated
111	Our division allows a 'learning' environment when we take on new sustainability projects	Collective efficacy for sustainability	Self-generated
112	In our division we often make decisions based on our values rather than financial profit.	Collective efficacy for sustainability	Self-generated
113	We can influence our customers in making good choices to reduce their environmental impact.	Collective efficacy for sustainability	Self-generated
114	We can choose suppliers that provide environmentally responsible goods and services	Collective efficacy for sustainability	Self-generated
115	As a division we effectively collaborate with government departments to build resilience in our customers' communities	Collective efficacy for sustainability	Self-generated
116	We actively put sustainability policy and procedures into action	Collective efficacy for sustainability	Self-generated
117	In our division we consider the longer term view (more than 1 year) in the decision making.	Collective efficacy for sustainability	Self-generated
118	We keep trying when things are going really badly regarding sustainability at work	Collective efficacy for sustainability	Self-generated
119	We don't let tough sustainability problems keep us down	Collective efficacy for sustainability	Self-generated
120	We do not give up on achieving our sustainability goals, even when times are tough.	Collective efficacy for sustainability	Self-generated
121	We focus and keep pushing our sustainability projects in good times and bad.	Collective efficacy for sustainability	Self-generated
122	"Our company is worried about its environmental impact"	Green work climate Perceptions	Norton, Zacher & Ashkansky, 2014
123	"Our company is interested in supporting environmental causes"	Green work climate Perceptions	Norton, Zacher & Ashkansky, 2014
124	"Our company believes it is important to protect the environment"	Green work climate Perceptions	Norton, Zacher & Ashkansky, 2014
125	"Our company is concerned with becoming more environmentally friendly"	Green work climate Perceptions	Norton, Zacher & Ashkansky, 2014

#	Possible Item	Related theme	Source
126	"In our company, employees pay attention to environmental issues",	Green work climate Perceptions	Norton, Zacher & Ashkansky, 2014
127	"In our company, employees are concerned about acting in environmentally friendly ways"	Green work climate Perceptions	Norton, Zacher & Ashkansky, 2014
128	"In our company, employees try to minimise harm to the environment"	Green work climate Perceptions	Norton, Zacher & Ashkansky, 2014
129	"In our company, employees care about the environment"	Green work climate Perceptions	Norton, Zacher & Ashkansky, 2014
130	(1) In my work, I weigh the consequences of my actions before doing something that could affect the environment;	Organizational Citizenship Behaviour for the Environment	Paille& Boiral, 2013
131	(2) I voluntarily carry out environmental actions and initiatives in my daily work activities;	Organizational Citizenship Behaviour for the Environment	Paille& Boiral, 2013
132	(3) I make suggestions to my colleagues about ways to protect the environment more effectively, even when it is not my direct responsibility.	Organizational Citizenship Behaviour for the Environment	Paille& Boiral, 2013
133	(1) I actively participate in environmental events organized in and/or by my company;	Organizational Citizenship Behaviour for the Environment	Paille& Boiral, 2013
134	(2) I stay informed about my company's environmental initiatives;	Organizational Citizenship Behaviour for the Environment	Paille& Boiral, 2013
135	(3) I undertake environmental actions that contribute positively to the image of my organization;	Organizational Citizenship Behaviour for the Environment	Paille& Boiral, 2013
136	(4) I volunteer for projects, endeavors, or events that address environmental issues in my organization.	Organizational Citizenship Behaviour for the Environment	Paille& Boiral, 2013
137	<i>(1) I spontaneously give my time to help my colleagues take the environment into account in everything they do at work;</i>	Organizational Citizenship Behaviour for the Environment	Paille& Boiral, 2013
138	<i>(2) I encourage my colleagues to adopt more environmentally conscious behaviors;</i>	Organizational Citizenship Behaviour for the Environment	Paille& Boiral, 2013
139	<i>(3) I encourage my colleagues to express their ideas and opinions on environmental issues.</i>	Organizational Citizenship Behaviour for the Environment	Paille& Boiral, 2013
140	In my daily work, I incorporate environmental and social factors into my decision making.	General sustainability tasks	Self-generated
141	In my daily work, I actively minimise any negative impact on the environment and society.	General sustainability tasks	Self-generated

#	Possible Item	Related theme	Source
142	In my daily work, I always follow company policy and procedures on the environment and health & safety	General sustainability tasks	Self-generated
143	In my daily work, I follow up with my direct reports to check if they are implementing social and environmental activities in their work	General sustainability tasks	Self-generated
144	In my daily work, I actively look for opportunities to improve my division's environmental & social footprint	General sustainability tasks	Self-generated
145	I initiate environmental and social projects at work.	General sustainability tasks	Self-generated
146	In my daily work, I share knowledge across relevant departments about environmental and social matters that affect our business.	General sustainability tasks	Self-generated
147	At work, I assist in developing better policies and procedures to improve our environmental and social impact	General sustainability tasks	Self-generated
148	I factor environmental and social project expenses into my divisions annual budgeting and planning.	General sustainability tasks	Self-generated
149	During my daily work I help others understand how to implement positive environmental and social behaviours.	General sustainability tasks	Self-generated
150	During my work, I pay attention to external trends linked to environmental and social issues, and factor these into my work.	General sustainability tasks	Self-generated
151	In my daily work, I seek out internal expertise on how to improve the environmental and social factors related to my work.	General sustainability tasks	Self-generated
152	When I make positive changes for the environment or society at work, I share this with my colleagues.	General sustainability tasks	Self-generated
153	In my daily work, I make those with whom I communicate, aware of our environmental and social responsibilities at work	General sustainability tasks	Self-generated
154	In my daily work, I make decisions that positively support my community and the natural environment	General sustainability tasks	Self-generated
155	In my daily work, I ensure that I put into practice what I have learnt regarding good environmental and socially ethical practices	General sustainability tasks	Self-generated

#	Possible Item	Related theme	Source
156	In my daily work, I reflect on how to improve my processes to take environmental and social factors into account.	General sustainability tasks	Self-generated
157	In my daily work, I collaborate with colleagues to improve processes for better environmental and social outcomes	General sustainability tasks	Self-generated
158	In my daily work, I actively reduce my use of energy and paper and production of waste.	General sustainability tasks	Self-generated
159	In my daily work, I seek guidance on environmental and social issues that concern my work, from the relevant internal people.	General sustainability tasks	Self-generated
160	1. To What extent does your job have an impact on the work of other people	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
161	2. To what extent do the jobs of your section or work group depend on the performance of your job?	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
162	3. How much effect does your job have on the performance of the rest of the jobs in your section	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
163	4. To what extent does your job require you to provide help or advice that other people must have to be able to do their jobs?	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
164	5. To what extent does your job require you to provide other people with support services that they need to do their work?	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
165	6. What percentage of your time do you spend giving help or advice other people need to do their work?	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
166	7. What percentage of your job activities go on to affect other peoples' work?	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
167	8. How many hours a day do you spend providing support services other people need to do their jobs?	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
168	9. Other peoples' work depends directly on my job.	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
169	10. Unless my job gets done, other sections cannot do their work.	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
170	11. Unsatisfactory performance of my job would delay the work performance of other people	Task interdependency (linked to collective efficacy)	Kiggundu, 1983

#	Possible Item	Related theme	Source
171	12. I provide other people with the help or advice they need to do their work.	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
172	13. I provide other people with materials, tools, or supplies which they need to do their work	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
173	14. I provide other people with information they need to do their work.	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
174	15. I provide support services which other people need to do their work.	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
175	1. How much does your job require support services provided by other people?	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
176	2. To what extent do you depend on other peoples' work to obtain the tools, materials or equipment necessary to do your job?	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
177	3. To what extent do you receive the information you need to do your job from other people?	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
178	4. What percentage of your job activities are affected by the work of other people?	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
179	5. Give the number of people whose work affects the activities of your job.	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
180	6. How long would it take your job performance to be affected by performance changes of other peoples' work?	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
181	7. For what percentage of your job performance are you dependent on support services provided by other people?	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
182	8. I spend a great deal of time on contacts with other people which help me get my work done	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
183	9. My job cannot be done unless other sections do their work.	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
184	10. I depend on other peoples' work for information I need to do my work.	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
185	11. I depend on other peoples' work for materials, tools, or supplies that I need to do my job	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
186	12. My job depends on the work of many different people for its completion.	Task interdependency (linked to collective efficacy)	Kiggundu, 1983

#	Possible Item	Related theme	Source
187	13. Most of my job activities are affected by the work activities of other people.	Task interdependency (linked to collective efficacy)	Kiggundu, 1983
188	1. We worked as a team—not a collection of individuals with their own tasks to perform	Task interdependency (linked to collective efficacy)	Wageman & Gordon, 2005
189	2. My work was not done until everyone had done his or her part	Task interdependency (linked to collective efficacy)	Wageman & Gordon, 2005
190	3. We often had to share materials and ideas to get our work done	Task interdependency (linked to collective efficacy)	Wageman & Gordon, 2005
191	4. In our group we worked together a lot.	Task interdependency (linked to collective efficacy)	Wageman & Gordon, 2005
192	5. In our group we rarely needed to count on each other a lot ( R )	Task interdependency (linked to collective efficacy)	Wageman & Gordon, 2005
193	6. I often had to talk to other people in my group in order to do my part well.	Task interdependency (linked to collective efficacy)	Wageman & Gordon, 2005
194	1. To what extent do the people in this unit have one-person jobs: that is, in order to get the work out to what extent do unit members independently accomplish their own assigned tasks?	Task interdependency (linked to collective efficacy)	Van de Ven et al, 1976
195	2. To what extent do all the unit members meet together to discuss how each task, case, or claim should be performed or treated in order to do the work in this unit?	Task interdependency (linked to collective efficacy)	Van de Ven et al, 1976
196	I am confident in making suggestions at work about ways to help this organization be more sustainable.	Self-efficacy for sustainability	Generated by Colleague S Pek
197	I am confident in my ability to make changes to my daily work that deliver on this organization's sustainability commitments	Self-efficacy for sustainability	Generated by Colleague S Pek
198	I am confident in my ability to explain to my colleagues how sustainability relates to my daily work	Self-efficacy for sustainability	Generated by Colleague S Pek
199	I am confident in sharing my opinions about sustainability among my colleagues.	Self-efficacy for sustainability	Generated by Colleague S Pek
200	I am confident that I can play a role in helping this company to become more sustainable.	Self-efficacy for sustainability	Generated by Colleague S Pek
201	I am confident that I can complete my work in a way that is in alignment with my organization's sustainability initiatives	Self-efficacy for sustainability	Generated by Colleague S Pek

#	Possible Item	Related theme	Source
202	I am confident that I can play a role in helping others around me at work to become more sustainable.	Self-efficacy for sustainability	Generated by Colleague S Pek
203	I am confident in my ability to make changes in my personal habits at work to be more sustainable.	Self-efficacy for sustainability	Generated by Colleague S Pek
204	I am confident in making suggestions to others at work about ways to be more sustainable.	Self-efficacy for sustainability	Generated by Colleague S Pek
205	I am confident in my ability to actively participate in my company's voluntary initiatives focused on improving sustainability	Self-efficacy for sustainability	Generated by Colleague S Pek
206	I am confident in my ability to encourage my coworkers to voice their opinions and concerns about sustainability	Self-efficacy for sustainability	Generated by Colleague S Pek

Academic colleague	Comment	Adjustment
A	Grammatical corrections and addition of a thank you note at the end of the survey	Grammar corrected and thank you note added
B	Inclusion of sustainability definition on leader page	Added a sustainability definition to the leader page
	Shift the meaning slightly from "everyone is working together"... "to everyone can work together"	Item changed to: "In this organization, everyone can work together effectively to meet our sustainability goals"
	Changing "As an organization, we continue to pursue our sustainability goals" to "...can continue"	Simplified to: As an organization, we pursue our sustainability goals, even when times are tough.
C	Changing "improve the sustainability of the work I do" to "... making it more sustainable".	Item modified to: "I am confident in my ability to make changes in my daily tasks in order to work more sustainably."
	"Changing item: The organization is <u>confident</u> about its future path to sustainability", to use the word clear instead of confident.	Changed item to "My company has a clear vision for sustainability."
	Clarify meaning of item: "People in this organization can work together" 1) because the structures are there, for example) (2) Have the ability to work together? Or (3) actually do work together?	Item modified to: "In this organization, everyone can work together effectively to meet our sustainability goals."
	For item "I <u>make changes</u> to improve the overall sustainability of my work processes." considered "make changes" too vague.	No change as needed an element of generalisation to make it applicable to all employees
D	Considered the survey might to take too long	This influenced the work on shortening the survey to under 15 minutes.
	It felt a bit like the questions were repeating themselves, potentially undermining my attention to the detail of difference or the next time a similar question was asked.	This created a stronger focus on where to eliminate similar questions
	found the "I am confident" opener interesting. This might be convention in such surveys but it made me think about confidence maybe more than the issues at hand.	This was left in as it is about to what extent people felt that could accomplish the tasks i.e. efficacy.

	<p>found this section challenging because it seemed to be based on some assumptions about my company having clear and well understood sustainability goals and that I did (understand sustainability goals) as an individual.</p>	<p>Inclusion of sustainability definition on leader page; removal of the terminology of 'goals' or 'commitments' to a more generalised version of 'make this organisation more sustainable'</p>
	<p>the questions were clear and understandable but as mentioned, I wasn't always convinced that they 'fit' my situation at work</p>	<p>Focused on general rather than specific tasks e.g. "I am actively looking for opportunities to improve my organization's sustainability performance". This is not linked to specific tasks but could apply to many tasks within an organization.</p>
	<p>Technical suggestion regarding showing number of questions remaining and font sizes.</p>	<p>Countdown of pages left was added and font sizes adjusted</p>