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Strategic Organizational Sustainability Climate: Scale Development and Validation

Petra Brnova

Strategic Organizational Sustainability Climate: Scale Development and Validation

by

Petra Brnova

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We the undersigned committee hereby approve the attached document, "Strategic Organizational Sustainability Climate: Scale Development and Validation," a dissertation by Petra Brnova.

Theodore Richardson, Ed.D.
Major Advisor
Dean and Professor
Nathan M. Bisk College of Business

Emily Martinez-Vogt, Ph.D.
Assistant Professor, Management
Nathan M. Bisk College of Business

Theresa Domagalski, Ph.D.
Adjunct Faculty, Management
Nathan M. Bisk College of Business

Lisa Steelman, Ph.D.
Dean and Professor
College of Psychology and Liberal Arts

Abstract

Title: Strategic Organizational Sustainability Climate: Scale Development and Validation

Author: Petra Brnova

Major Advisor: Dr. Theodore Richardson

The Strategic Organizational Sustainability (SOS) Climate encompasses the employee perceptions of the policies, practices, and procedures that promote long term organizational success in the era of pressing economic, social, and environmental challenges. In order to promote such workplace climate, organizations must be able to measure it. To this end, the SOS Climate scale was developed and validated using first a phenomenological approach in interviews with sustainability professionals working in organizations across economic sectors. After this, scale items were generated and judged, followed by a pilot study. Principal component analysis was conducted for preliminary dimensionality and item reduction. Lastly, confirmatory factor analysis was conducted on a new sample of full-time employees in the US for scale validation. Results and implications of the scale as a business measurement tool are discussed as well as strengths and limitations of the current study. Finally, recommendations for future research are also provided.

Keywords: organizational climate, sustainability, triple bottom line, corporate social responsibility, strategic management, assessment

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Dedication

To Beba, Jana, Lisa, Sohair, and Emily.

Chapter 1
Introduction

Overview

"What is good for the world and good for business are more closely connected than ever before."

--Chuck Robbins, CEO of Cisco Systems

"We are at the turning point. Only businesses that help people and planet thrive will succeed."
--Paul Polman, CEO of Unilever

"Our company has an important role to play in tackling some of humanity's greatest challenges. By fostering a long-term, strategic approach to our business and our contributions to society, we can not only strengthen our future as a company but also fulfill our commitments to make this a better, healthier world for all."

--Kenneth C. Frazier, chairman and CEO of Merck

As is evident from the above quotes, the CEOs of the largest Fortune 500 companies increasingly agree and recognize the monumental sustainability challenges the world is facing. At the same time, these business leaders also recognize the significant opportunities for their organizations in pursuing solutions to environmental, social, and economic woes (Eccles, Miller-Perkins, & Serafeim,

2012; Ioannou & Serafeim, 2019; Quinn & Baltes, 2007; Kiron, Kruschwitz, Haanaes, & Fuisz-Kehrbach, 2013; McKinsey & Company, 2010; 2014).

In an era of unparalleled technological change (e.g., artificial intelligence (AI), machine learning, robotics, virtual reality (VR), gene editing, synthetic biology, quantum computing, big data) the world in general, and the business world in particular, is facing interrelated, global threats of population growth, resource depletion, rapid urbanization, hazardous waste, rapid ecosystem degradation, loss of biodiversity, pollution, and climate change (Winston, 2018). Addressing these global threats presents a challenge. It also presents a business opportunity of a lifetime. For example, there is an estimated trillion-dollar market for low-carbon goods and services (WRI's Global Commission on the Economy and Climate, 2018).

Selected Global Trends

According to OECD (2016), the world's population is expected to grow during the 21st century, reaching 8.5 billion by 2030 and 9.7 billion by 2050. With the exception of Africa, the world population is expected to age significantly, with an estimated 10% of the global population consisting of people over the age of 80 by 2050 (OECD, 2018). Global population growth combined with economic

growth will place unprecedented pressures on natural resources, chiefly among them water, food, and energy.

Severe water shortages are expected around the world, while food insecurity is expected to persist. Both surface and groundwater are expected to become increasingly polluted due to poor agricultural practices and limited wastewater treatment. Climate change is expected to further excelarate due to sharp increases in energy consumption (OECD, 2020).

According to the latest report from the Intergovernmental Panel on Climate Change, severe impacts related to changing climate are expected to include more frequent and longer-lasting heat waves, extreme and variable precipitation events, continuous warming, and acidification of oceans, permafrost melting, and sea-level rise (IPCC, 2018).

Changes in temperature and precipitation regimes further add to pressures on biodiversity (e.g., habitat alteration and fragmentation, toxic contamination, acidification, oil spills and other pollution, and alteration of species dynamics and structure through the release of exotic species or the commercial use of wildlife resources), which impact the distribution of species and ecosystems. Biodiversity loss is a major environmental challenge (OECD, 2018). Despite some local successes, biodiversity is on the decline globally, and this loss is projected to

continue (OECD, 2016). Around 20% of mammals and birds, almost 40% of reptiles, a third of amphibians, and a quarter of marine fish are already on the list of threatened species (OECD, 2016).

UN Sustainable Development Goals

Aware of the global sustainability trends and significant problems they pose, the United Nations set an ambitious global sustainability plan of action for people, planet, and prosperity in 2015, called the Agenda 2030, with 17 Sustainable Development Goals (please see Appendix E for a complete list of the UN SDGs). Such goals apply to the entire global economy, not a specific industry or organization. Each of these 17 SDGs has a set of indicators attached to it.

For example, Goal 7. *Ensure access to affordable, reliable, sustainable, and modern energy for all* includes the following indicators:

- Proportion of population with access to electricity
- Proportion of population with primary reliance on clean fuels and technology
- Renewable energy share of total final energy consumption

Under these serious circumstances, sustainable business and sustainable economic development seek to create novel ways of doing business while redefining business performance in terms of economic, social, and environmental impacts. In this new sustainability paradigm, social and environmental responsibilities are viewed as fundamental parts of business conduct.

While recognizing that sustainability is a strategic issue, most companies still treat it as a peripheral add-on (Bertels, Papania, & Papania, 2010; Margolis & Walsh, 2003). Companies can improve their chances of corporate success and survival by integrating sustainability into their corporate "bloodstream" and using it consistently in strategic and operational decision-making from the factory floor all the way to the C-suite. Only then can sustainability effectively provide strategic value while helping to improve social and environmental systems upon which organizations rely on. Creating a corporate environment conducive to sustainability requires measurement. A science-based, valid, strategic organizational sustainability climate assessment tool can tell companies where they stand on their sustainability journey, and areas in which they can improve, as well as provide benchmarking data useful for comparing their triple bottom line (TBL) climate performance against that of competitors. Such an assessment is currently missing in the extant literature. An argument can be made that companies that adopt such a climate scale can gain a competitive advantage in the long run.

Background and Rationale of the Study

Business leaders increasingly believe that triple bottom line sustainability is vital to their business success, both now and in the future (Lacy, Cooper, Hayward, & Neuberger, 2010; Lindgreen, Maon, Vanhamme & Sen, 2013; Bonini, & Bové, 2014). Top advantages associated with adopting TBL cited by CEOs include increased revenues and market share, improved employee retention, and reduced risks (Quinn & Baltes, 2007; Willard, 2012).

Similarly, the findings spanning research areas of stakeholder theory, corporate social responsibility, shared value creation, and natural resource-based perspective show that organizations, which place strategic value on sustainability and integrate it into their lists of priorities, are able to create business value while simultaneously addressing vital societal concerns (Aguinis & Glavas, 2013; Bertels, Papania, & Papania, 2010; Hart, 1995; Margolis & Walsh, 2003; McWilliams & Siegel, 2011; Porter & Kramer, 2011).

The leaders of organizations striving to embed sustainability into their day to day operations need to promote organizational context or climate focused on sustainability. Such leaders need a valid, science-based assessment tool of strategic organization sustainability climate.

Literature review revealed a lack of theoretical and empirical work on strategic organizational sustainability climates. Strategic climate research linked to

outcomes such as safety and ethics provided initial information. This presents an opportunity for theoretical development and empirical testing.

Statement of the Problem

Current global megatrends show that business as usual is no longer sustainable (Hart, 1995; Portney, 2015; Winston, 2018). To thrive in a changing business landscape, organizations need to adopt sustainable practices. Research shows that work contexts have a significant influence on the behavior of people working in those contexts (Schneider & Barbera, 2014; Kuenzi & Schminke, 2009). Business leaders have a responsibility to create work environments, or organizational climates, to encourage behavior they wish to see. To create a workplace environment for sustainability, managers need an assessment tool. Currently, companies that wish to assess their organizational climate with respect to sustainability do not have access to a science-based measurement instrument they can rely on.

Purpose of the Study

Business leaders increasingly recognize that addressing sustainability challenges delivers benefits to their organizations through reduced costs and risks of doing business, as well as increased brand reputation, attractiveness to potential employees, customer loyalty, and profitability (Bonini & Bove, 2014; Fox, 2008;

Lindgreen, Maon, Vanhamme, & Sen, 2013; Quinn & Baltes, 2007). While recognizing that sustainability is a strategic issue, as stated earlier, most companies still treat it as a peripheral add-on (Bertels, Papania, & Papania, 2010; Margolis & Walsh, 2003).

For sustainability to effectively provide strategic value while helping the social and environmental systems crucial to business operations, it needs to be fully embedded into the organizational "genetic code" (Howard-Grenville, Bertels & Lahneman, 2014; Porter & Kramer, 2011). This way, it can guide everyday decision-making across levels and functions. Creating such a triple-bottom-line sustainability-focused work context requires a science-based measurement tool. Such a tool is currently missing in the literature, and this study aims to fill that gap.

The Strategic Organizational Sustainability climate scale (SOS Climate Scale), seeks to address this by providing a diagnostic tool that will give insight into the effectiveness of sustainability policies, procedures, processes, and supervisory behaviors surrounding them, which can directly impact hard outcomes. Practitioners will be able to use the scale's dimensions to guide the development of training, coaching, and change initiatives. It will also provide a vital tool for organizational development, as it will provide benchmarking data. Lastly, by conducting sustainability climate assessment, companies will communicate

organizational values to employees and foster alignment across the organization. This examination of both empirical and practitioner literature yielded several sustainability culture and climate models, as well as initial examples of measurements of sustainability climate, each showcasing major limitations (see Appendix D). Therefore, the purpose of the current study is to develop a scientifically-sound, statistically valid, comprehensive measure of the strategic organizational sustainability climate.

Questions that Guide the Research

What constitutes the construct of a strategic organizational sustainability climate?

How can we measure this construct?

Definition of Key Terms

1) Sustainable Development (SD)

Development that meets the present needs without jeopardizing the ability to do the same for future generations (UN WCED, 1987).

2) Corporate Social Responsibility (CSR)

The responsibility of business involves the fulfillment of the economic, legal, ethical, and discretionary expectations of society at a particular time (Carroll, 1979).

3) Stakeholder

“A stakeholder in an organization is any group or individual who can affect or is affected by the achievement of the organization’s objectives” (Freeman, 1984). (e.g., stockholders/shareholders, employees, customers, suppliers/vendors, government, creditors, retailers/wholesalers, community)

4) Friedman Doctrine

"There is one and only one social responsibility of business to use its resources and engage in activities designed to increase its profits so long as it stays within the rules of the game, which is to say, engages in open and free competition without deception or fraud." (Friedman, 1970). Also referred to as the traditional growth and profit-maximization model or the shareholder theory.

5) Corporate (Business) Sustainability

Simultaneously pursuing the following three principles: “environmental integrity through corporate environmental management; social equity through corporate

social responsibility; and economic prosperity through value creation" (Bansal, 2005).

6) Environmental, Social, and Governance (ESG) Factors

In sustainable investing (or socially responsible investing), ESG or environmental, social, and corporate governance factors are used as part of the process of evaluating companies for investment opportunities. (Eccles & Viviers, 2011).

7) Externalities

"Side-effects of production and consumption that are not reflected in the price of a product" (Rothaermel, 2013).

8) Triple Bottom Line (TBL) Sustainability

"Balancing economic, environmental and social performance" (TBL; Elkington, 1994). TBL is also referred to as the three pillars of sustainability informally known as 3Ps (People-Planet-Profits).

9) Sustainable Competitive Advantage

"Outperforming competitors or the industry average over a prolonged period of time" (Rothaermel, 2013).

10) Organizational Culture

"Accumulated shared learning of a group as it solves its problems of external adaptation and internal integration; which has worked well enough to be considered valid and, therefore, to be taught to new members as the correct way to perceive, think, feel, and behave in relation to those problems. This accumulated learning is a pattern or system of beliefs, values, and behavioral norms that come to be taken for granted as basic assumptions and eventually drop out of awareness" (Schein, 2017).

11) Organizational Climate

"Shared perceptions of and the meaning attached to the policies, practices, and procedures employees experience and the behaviors they observe getting rewarded and that are supported and expected. Two types of climates are recognized in the literature, namely generic climates for well-being and strategically focused climates linked to important organizational outcomes" (Schneider, Ehrhrat, & Macey, 2013).

Significance of the Study

There is a growing consensus that sustainability is a strategic issue for organizations of all kinds (Kiron, Kruschwitz, Haanaes & von Streng Velken, 2012; Lacy, Cooper, Hayward, & Neuberger, 2010). Yet, in most organizations today, it is still treated as a tangential issue separate from the core business. To reap

the benefits of sustainability and to make a real positive impact, organizations need to embed sustainability into their organizational core activities (Hart, 1995; Porter & Kramer, 2011). Only then can sustainability provide strategic value without undermining the social and environmental systems on which organizations themselves extensively rely (Willard, 2012). To do so, they need a science-based assessment tool, which is currently lacking in the literature (Howard-Grenville et al., 2014; Patterson et al., 2005). A strategic organizational sustainability climate scale will help organizations gauge how well their sustainability efforts are working, and reveal areas for improvement, as well as provide data for competitive benchmarking. This assessment can help in their efforts to gain and sustain competitive advantage over their business rivals (Schneider & Barbera, 2014).

The current research will contribute to the literature in several ways. Firstly, sustainability is a salient topic that is attracting growing attention of both researchers and practitioners. Prior research has already explored the relationship between environmental sustainability and business performance (Ameer, & Othman, 2012; Wagner, 2007; Hart, 1995), as well as between corporate social responsibility and corporate financial performance (Orlitzky, Schmidt, & Rynes, 2003, Waddock & Graves, 1997; McWilliams & Siegel, 2000). Yet, the literature on creating organizational contexts conducive to integrating triple bottom line sustainability in corporate bloodstream is lacking. This study will address this gap

and extend the literature in strategic management and organizational behavior by focusing on the vital yet neglected topic of integrating triple bottom line sustainability into work contexts. Specifically, the study will conceptualize and operationalize the strategic organizational sustainability climate construct. Application of the scale for measuring this construct will help guide organizations in their TBL sustainability activities.

Organization of the Remainder of the Study

The remainder of the manuscript is organized as follows. In Chapter 2, a thorough review of the literature related to triple bottom line sustainability and associated frameworks from the fields of strategic management, business ethics, and organizational behavior will be reviewed and synthesized. Chapter 3 will discuss and describe methodology approaches. The results and findings will be presented in Chapter 4. Lastly, in Chapter 5, conclusions, limitations, recommendations, and implications for practice, as well as suggestions for future research, will be presented.

Chapter 2
Literature Review

Overview

Sustainability, as reflected by a triple bottom line, is, by its nature, a complex construct spanning multiple disciplines. In this section, strategic sustainability-related theoretical frameworks from the fields of strategic management, business ethics, and organizational behavior will be discussed.

Questions that Guide the Research

What constitutes the construct of a strategic organizational sustainability climate?

How can we measure this construct?

Conceptualizing and Measuring Sustainability

The concept of sustainability is both ubiquitous and controversial. It means different things to different people. There is no single agreed-upon definition of sustainability as many different terms are used interchangeably and keep proliferating in the literature. For example, Bansal (2005) views sustainability as a corporate sustainable development with three interrelated principles of environmental integrity, social equity, and economic prosperity. On the other hand, Goodland (1995) focuses exclusively on environmental sustainability (ES) and

defines it as maintenance of life-supporting systems (read capacities of global ecosystems). Other terms one may encounter in the literature include but are not limited to sustainable development, corporate social responsibility, corporate citizenship, corporate sustainability, stakeholder management, corporate responsibility, environmental, social and governance issues (ESG), and so on (Aguinis & Glavas, 2012; Bansal, 2005; Waddock, 2004; Carrol, 1999; Elkington, 2006; PwC's ESG Pulse, 2016).

Some of the broad dictionary definitions of this concept include the following: "The verb 'to sustain' came into English from the French soutenir (in Italian, the verb is sostenere). It means to keep a person or a community from failing; or to cause something to continue at its existing level or standard" (CREDO Sustainability, 2008).

Sustainability is often equated with sustainable development (SD). The most widely cited definition of SD comes from the Brundtland report, which defines it as an economic development that: "meets the needs of the present without compromising the ability of future generations to meet their own needs" (UN WCED, 1987). The notion of intergenerational equity is closely tied to this definition of sustainability.

Another commonly used definition views sustainability as "improving the quality of life while living within the carrying capacity of supporting ecosystems" (WCU, 1991). Yet other researchers argue that a defining feature of sustainability is consideration of time and balancing short-term profit obligations to shareholders with long-term investments in future income streams (Bansal & DesJardine, 2014). The notion of management of intertemporal trade-offs is strongly related to this conceptualization of sustainability. In other words, what is good for business and society in the short term may not be at all good in the long run.

Other related concepts include 3E's of environmental protection, economic efficiency, and social equity (Bansal, 2005; Campbell, 1996; Portney, 2003), and the triple bottom line (TBL; Elkington, 1997), a concept from the field of accounting, which is also informally known as the 3P's or people, planet, profits. The TBL framework accounts for the social and environmental (non-financial) performance of an organization, in addition to the traditionally important economic one in reporting (disclosure). These are the three pillars or domains of sustainability. In other words, to be deemed truly sustainable, an organization must embody practices that are economically responsible, environmentally sound, and socially equitable. Balancing these three pillars is challenging, partly because there is no clear definition of what constitutes each of the pillars.

For example, the economic pillar (or domain), which focuses on the economic impact that the company has on society, can include areas such as ethical and responsible financial management and accounting (with typical KPI such as shareholder value, revenue, operational efficiency/profitability, and leverage/risk estimates), reporting on anti-competitive behavior, anti-fraud, corruption, and other internal controls preventing mismanagement of corporate finances and negative impacts on company and its stakeholders (Collin & Collin, 2010b).

The social pillar, which focuses on social initiatives, can include areas such as human health and safety, labor relations, issues of equity, fairness, diversity and inclusion, non-discrimination, child labor, supplier relations, community involvement, volunteering, charitable giving, and philanthropy (Collin & Collin, 2010b).

The environmental pillar focuses mainly on environmental stewardship and can include areas such as ecosystem status, responsible resource use (energy use, water use, land use), GHG emissions, waste to landfill, materials, and biodiversity (Collin & Collin, 2010b).

Much as with the lack of consensus on the definition of sustainability, there is no one standard way to measure and report on non-financial performance (social and environmental). Hence, a variety of metrics proliferate in the literature and

practice. Some of the well-known examples of sustainability metrics include AASHE STARS, GRI, and ISO Standards. Specifically, the Association for the Advancement of Sustainability in Higher Education's (AASHE) Sustainability Tracking, Assessment, and Rating System (STARS), for instance, includes the following dimensions and sub-dimensions (AASHE, 2018):

1) Academics (AC)
    a. Curriculum, and
    b. Research
2) Operations (OP)
    a. Air & climate
    b. Buildings
    c. Energy
    d. Food & dining
    e. Grounds
    f. Purchasing
    g. Transportation
    h. Waste
    i. Water
3) Engagement (EN)
    a. Campus Engagement
    b. Public Engagement

4) Planning & Administration (PA)
    a. Coordination & Planning
    b. Diversity & Affordability
    c. Investment
    d. Wellbeing & Work
5) Innovation & Leadership (IN) – optional
    a. Innovation
    b. Exemplary practice

Alternatively, ISO 14001 Standards developed by the International Organization for Standardization, a nongovernmental organization, are used internationally and focus mainly on the environmental management of an industrial plant. ISO 26000 provides guidance for the tracking and reporting on social responsibility-related activities.

One of the most-widely used sustainability assessments is the Global Reporting Initiative (GRI), a large multi-stakeholder network of international experts who jointly develop the GRI reporting framework and use GRI guidelines for their non-financial disclosure.

For the most part, organizations are free to use any of the well-established frameworks mentioned above, or develop and use their own metrics, for their sustainability reporting.

The triple bottom line sustainability framework (TBL; Elkington, 1997) will be used in this study.

Why should organizations care about TBL sustainability?

The short answer to this question would be because their future success and viability may depend on it (Bansal & DesJardine, 2014; Willard, 2012). TBL showcases inherent interdependencies between healthy business, healthy society, and healthy environment (O'Connor, 2006; Elkington, 2006). In the long run, you cannot achieve one without the others. It is quite simple, really; a healthy economy is dependent on healthy business, which is fully dependent on a healthy society, and both business and society rely on a healthy ecosystem for their survival (Arnaud, Tinoco & Rhoades, 2013). Economic sustainability alone, while important, is not sufficient for corporate sustainability in the long term (Bansal, 2005). In short, sustainability requires a long-term approach to decision making, incorporates TBL factors and recognizes inherent interdependencies as well as risks and opportunities between them (Elkington, 2006).

Sustainability is critical to how an organization competes in today's markets (Epstein & Roy, 2003). In today's hypercompetitive business landscape, with its rapidly evolving consumer preferences, sustainability offers several benefits which can help organizations stay ahead of competition. By looking at the world as a

system, and by inspecting previously overlooked relationships, the sustainability perspective can help uncover opportunities and threats that may loom just around the corner. It forces organizations to answer vital questions such as: What are the known externalities associated with our goods, services, and production, and business operations? What are potential new risks that could emerge in the future?

Sustainability is a sensible long-term strategy (Bansal & Hoffman, 2012). By pursuing sustainability, companies can improve their efficiency by reducing energy use, waste, and other costs in their operations (Willard, 2012). They can enhance their revenues and capture competitive advantage by creating innovative new products and services, opening new markets, and attracting, retaining, and motivating the best employees (Grimmer & Bingham, 2013; Hart, 1995; Khojastehpour & Johns, 2014, Porter & Van der Linde, 1995; Porter & Kramer, 2006). Moreover, by pursuing a sustainability strategy, companies can mitigate potentially damaging supply change discruptions, reduce legal risks and insurance costs, as well as improve their corporate and brand reputation (Aguinis & Glavas, 2012; Lindgreen, Maon, Vanhamme & Sen, 2013; Hitchcock & Willard, 2006; Shrivastava, 1995).

On the other hand, organizations that choose to ignore this worldwide trend may face several threats, such as liability for pollutants, supply problems with raw

materials, attacks on their brand, and increased legal risks. For illustration, PG&E Company found liable for dumping a known carcinogen (hexavalent chromium) in the ground effectively contaminating the water for surrounding community in the Hinkley, California was forced to pay over $333 million in court settlements, as well as over $750 million in remediation costs (The Associated Press, 2008; O'Brian, 2013). Similarly, BP , the London based oil and gas company, which was found liable for the Deep Water Horizon Explosion and Oil Spill in the Gulf of Mexico, was forced to pay around $5 billion in related court settments and clean-up costs (EPA n.d.; Bousso, 2018).

Many organizations today have sustainability programs, but they are largely peripheral, compliance-oriented, and lack systematic assessment (Elkington, 2006; Hoffman & Bansal, 2011). In other words, they do the bare minimum required by the legal system.

Why is a strategic organizational sustainability climate scale needed?

Some popular businesses which have made sustainability their declared mission; an example is Tesla, with a mission statement "to accelerate the world's transition to sustainable energy". This suggests that traditional companies may soon find it necessary for their survival to follow and pursue a policy that can claim, and validate their claim, of a similar commitment. In the case of Tesla, the fact that

customers are willing to pay a premium for an electric vehicle or solar roof in order to support sustainability, and be part of a solution rather than part of a problem, shows that there are ample opportunities for businesses in sustainability. While there are many sustainable startups coming online, many more existing firms did not start with sustainability in mind and hence need to transform their operations in order to compete. This is where the value of the strategic organizational sustainability climate scale lies. This tool may be able to help organizations advance sustainability and transform themselves into viable competitors in ever-changing global markets.

To reap the benefits of sustainability, organizations need to make it part of their corporate strategy and embed it into their daily operations. In other words, they need to build an internal organizational climate that embraces sustainability, which in turn requires balancing economic, social, and environmental impacts. To this end, assessments are needed to diagnose their current state along the sustainability continuum. However, at the present time, an evidence-based measure of a strategic organizational sustainability climate is lacking in the literature. The purpose of this study is to fill this gap by developing and validating a measure of strategic organizational sustainability climate for diagnostic purposes, helping organizations across economic sectors assess their organizational climate as well as formulate strategies to improve it at the organizational, group, and individual level.

Strategically focused organizational sustainability climate survey dimensions can serve as a guide that can give organizations direction on aspects they can impact to build more robust corporate sustainability cultures.

Theoretical Frameworks from Strategic Management

Strategic management revolves around the notion of capturing and sustaining competitive advantage. In the era of sustainability, competitive edge is reframed and redefined based on constraints posed by the megatrends in the social and natural environment. The following frameworks, which include Hart's (1995) Natural Resource Based View (NRBV), Porter and Kramer's (2006) Creating Shared Value (CSV) framework, and Freeman's (1984) Stakeholder Theory, provide deeper insights into the strategic view of sustainability challenge.

Natural Resource Based View. This framework attempts to integrate and address a neglected topic in strategic management: that of the environmental impacts of business activities and their importance as a future source of competitive advantage. Building on the resource-based view of the firm or RBV (Barney, 1991; 1995; 2011, Penrose, 1959; Wernerfelt, 1984) and dynamic capabilities framework (Teece, Pisano, & Shuen, 1997), a more comprehensive model labeled the Natural Resource Based View of the firm (NRBV; Hart, 1995; Hart & Dowell, 2011) was developed. The NRBV argues that RBV model's insufficient delineation of a firm's

environment makes it of limited use with regard to locating future sources of competitive advantage in the era of sustainability. NRBV is hence addressing this issue by explicating the relationship between the firm and its natural environment. Two major building blocks of NRBV theory include: 1) a link between the natural resource-based view and sustained competitive advantage (SCA), and 2) interconnectedness between three proposed environmental strategies (Hart, 1995).

NRBV and SCA. Similar to VRIN characteristics of costly-to-copy resources and capabilities of RBV, Hart (1995) describes qualities of resources that are needed for achieving sustainable competitive advantage in terms of their rareness (or firm specificity), social complexity, and their tacit nature. He also points out the necessity that these resources be valuable and non-substitutable (Hart, 1995). While resources are thought of as something that a firm owns, capabilities are seen as something a firm can perform by utilizing resources and employing routines. Hart (1995) further suggests that looking strictly inside the firm and neglecting to survey the external environment may be counterproductive to achieving sustained competitive advantage, as issues of social legitimacy and reputations play an important role here. Specifically, social legitimacy and good reputation are said to have a reinforcing and differentiating potential on the firm's competitive position (Hart, 1995).

Three proactive environmental strategies suggested in the NRBV framework include pollution-prevention, product stewardship, and sustainable development (Hart, 1995). In terms of pollution-prevention strategy, the aim is to prevent waste and reduce emission via continuous improvement processes akin to total quality management (TQM). A key tenant of TQM is waste elimination, be it time, material, or effort. In this way, pollution is seen as a form of waste that needs to be eliminated in pursuit of quality. Hart (1995) acknowledges that this strategy is labor-intensive, as it relies on tacit knowledge and skill development via employee involvement. Yet, the very tacit nature of this capability makes it hard to imitate quickly. Based on the above, Hart (1995) suggests that firms with TQM in place may experience faster results in pollution prevention than firms that do not practice TQM. Looking outside the firm, Hart (1995) argues that a firm's external stakeholders nowadays require transparency and visibility with regards to firm's corporate practices. He further suggests that voluntary disclosure/reporting of social and environmental impacts via, for example, ISO 14001 Standards for Environmental Management, may enhance a firm's reputation, image and legitimacy (Hart, 1995). In this way, pollution prevention should evolve over time from an internal competitive process to an external legitimacy-building activity (Hart, 1995). The author points out that in many cases however, what can be observed in practice is the reporting without actual pollution prevention practice in

place (e.g., Volkswagen's emission scandal of 2015, Mitsubishi's fuel economy scandal of 2016, and other "clean diesel" carmakers' fraudulent activities).

Similarly, product stewardship (see also terms such as extended producer responsibility or EPR, and circular economy) represents a competitive strategy with a focus on life-cycle-management (LCM) which incorporates life-cycle-assessment (LCA) into a company's product development (Hart, 1995). Essentially, a product stewardship strategy extends pollution prevention down the value chain. According to Hart (1995), this strategy is also labor-intensive and requires complex coordination between functional groups within an organization, as well as giving voice to key external stakeholders, for example via corporate advisory council, in deciding which products should be designed and developed. Based on these requirements, Hart (1995) suggests that firms which possess the complex capabilities required by product stewardship will reap the benefits of sustained competitive advantage in the form of accumulation of complex resources more readily than firms which do not possess such capabilities.

Lastly, sustainable development strategy is said to be driven by strong environmental and social purpose, which in turn impacts corporate strategy (Shrivastava & Hart, 1995). The aim here goes beyond reducing environmental damage to actually producing goods in the manner that can be maintained

potentially indefinitely (Shrivastava & Hart, 1995). This is where leadership and the communication of a compelling long-term vision takes the central stage (Hart, 1995). Due to the difficulty of crafting such a vision and generating buy-in from all ranks of employees to make it truly a shared vision, it represents a rare resource (Shrivastava & Hart, 1995). Much as with the prior two environmental strategies, sustainable development is viewed as an internally focused strategy only in the short run, but requires broader collaboration between public and private institutions (akin to the UN Global Compact) for requisite technological change in the long run (Shrivastava & Hart, 1995).

These three environmental strategies are seen as interconnected, path-dependent, and embedded, a fact which further complicates the issue. Essentially, Hart (1995) suggests that three strategies in NRBV need to be employed in a sequential order, as the ability to execute, for example, product stewardship strategy depends on resources and capabilities associated with pollution prevention and so on. Paradoxically, capabilities associated with each strategy need to be developed in parallel in order to reap the full benefit of the synergies which exist across the three strategies (Hart, 1995). For example, sustainable development strategy facilitates development of capabilities in pollution prevention and product stewardship because they are embedded within it (Hart, 1995).

In the next iteration of NRBV, sustainable development strategy, which was criticized as being too broad, was further elaborated into two separate areas, namely base of the pyramid and clean technology (Hart & Dowell, 2011; Prahalad, 2010). The base of the pyramid (BoP; Hart, 2005; Hart & Christensen, 2002; Prahalad & Hart, 2002; Prahalad, 2010) part of sustainable development focuses on a typically neglected market: people at the bottom of an economic pyramid and their unmet needs. In 2013, over 700 million people in the world were estimated to live in poverty, defined by the World Bank as living on less than $1.90 a day (World Bank, 2016). Some suggest that there are strategies that can simultaneously serve the BoP communities while realizing a profit. One of the strategies explored in this area is called embedded innovation. This approach requires firms to closely collaborate with BoP communities in creating businesses instead of just marketing low-cost products to them (Hart & Dowell, 2011).

In effect, the BoP approach rests on the assumption of mutual value creation. While literature in this area is slowly growing, it is largely oriented at practitioners with a dearth of theoretical and empirical research.

Another area in sustainable development focuses on clean technology. According to Hart (1995; 1997), sustainable development entails lowering material and energy consumption in developed markets and creating markets in the

developing countries at the same time. The reduction in material and energy consumption occurs via clean technologies. Firms can realize competitive advantage by building new competencies required by pursuing clean technology strategies (Hart, 1997).

While informative, this framework focuses exclusively on the relationship of business and the natural environment. There is only a tangential connection to social impacts, which are necessary aspects of the triple bottom line view of sustainability.

Creating Shared Value. The creating shared value framework (CSV; Porter & Kramer, 2006; 2011) suggests that organizations should look for business opportunities in solving social and environmental issues. In doing so, they reinforce corporate strategy by improving social conditions. The authors suggest that, in this manner, CSV is more effective than corporate social responsibility CSR; Carroll, 1979; 1991; 1999) or environmental sustainability frameworks.

According to Porter and Kramer (2006), CSR activities (i.e., corporate citizenship, philanthropy, corporate governance, and adherence to law) of firms, to date, produced very little meaningful impact largely due to two factors, namely (1) tendency of CSR activities to create tension between business and society when the two are interconnected, and (2) tendency of CSR activities to force companies into

generic checklist-types of responses instead of responses aligned with their strategy. In other words, the major culprit behind lack of meaningful impact of CSR activities is that the majority of disparate approaches to CSR are completely disconnected from business and strategy (Porter & Kramer, 2006). In this manner, CSR activities are seen as an expense, constraint or charity instead of as a genuine business opportunity (Porter & Kramer, 2006). Moreover, generic CSR approaches do not aid any company in identifying, prioritizing, and tackling those social and environmental issues on which a particular company may be able to have the biggest impact (Porter & Kramer, 2006). The solution offered by the CSV is in the form of the integration of society and business, via integration of social and environmental perspectives into existing business frameworks that guide a company's business strategy, as one is clearly dependent on the other. At the core of the CSV is the principle of shared value, which explicates the link between society and business and specifies that choices made must benefit both sides (Porter & Kramer, 2011). One cannot profit at the expense of the other without compromising long-term prosperity for both. In guiding a company's choice of CSR priorities, the CSV framework suggests narrowing options by categorizing social issues impacting a company into three categories. These three categories include (1) generic social issues, (2) value chain social impacts, and (3) social dimensions of competitive context (Porter & Kramer, 2011). It should be noted that

this categorization will be different for different business units, industries, and geographic locations. The aim of this categorization and prioritization of social issues is the explicit and strategic corporate social agenda. According to Porter and Kramer (2006; 2011), the more closely the social issue is connected to a company's business, the greater opportunity is there for a business to leverage its resources and capabilities to address it. As Porter (1991) suggests, strategy is about making choices, including what not to do. It requires discipline and focus and the same goes for a strategic approach to CSR akin to CSV.

Stakeholder theory. This framework extends the accountability of an organization for its performance exclusively from a shareholder group to all appropriate stakeholders (i.e., employees, customers, suppliers/vendors, government, creditors, retailers, and community). Freedman (1984), defines stakeholders as any group or individual who can affect or is affected by the achievement of the organization's goals (p. 46).

In contrast to the traditional shareholder view of the firm (Friedman, 1970), which assumes primacy of shareholders' interests, stakeholder theory argues that firms need to pay attention to legitimate interests of and create value for not just the firms' shareholders but for a wider group of stakeholders (Freeman, 1984). Such stakeholders include suppliers, customers, employees, unions, financial institutions,

government agencies, media, competitors, consumer advocate groups, special interest groups, and local communities impacted by firms' operations (Freeman, 1984; Freedman, Harrison, & Wicks, 2007). This framework views the business environment of the firm as a network of related groups. Satisfying the needs and interests of these various groups keeps a firm successful in the long run. Therefore, the number one job of any executive is to manage and shape such relationships.

This framework places great value on stakeholder analysis, management and engagement. It also emphasizes the need for balancing often-conflicting interests of stakeholders. According to Philips, Freeman and Wicks (2003), this theory applies not only to corporations, but also to partnerships, small or medium-size businesses, non-profits, and governmental organizations. Organizations, which practice stakeholder management are said to be more successful than ones which do not, in terms of traditional financial and market performance criteria such as, profitability, stability, and growth (Berman, Wicks, Kotha, & Jones, 1999; Waddock & Graves, 1997).

While the Stakeholder theory provides important insights into the social component of sustainability, it largely neglects the environmental component. A major critique of this framework involves the argument that the theory focuses exclusively on the relationship between business organizations and people

(stakeholders). According to this theory, the natural environment is not a stakeholder (Philips, 2003). As such, the natural environment, which is an integral part of the triple-bottom-line definition of sustainability, does not figure in and is not explicitly considered in the stakeholder theory.

Theoretical Frameworks from Business Ethics

After the Enron collapse and WorldCom bankruptcy, which significantly impacted a wide array of stakeholders, the U.S. government was under pressure to act (Markham, 2015). To address the influx of such massive corporate financial scandals and mitigate their negative impacts, in 2002, the U.S. Congress passed the Sarbanes-Oxley Act, which requires that organizations have a Code of Ethics. A relatively new field of business ethics, which focuses on responsible decision-making in business context (not just on a legal compliance basis), grew out of the pressing need for such a discipline (Carroll & Buchholtz, 2014).

While some argued that the social responsibility of business is to increase its profits (Friedman, 1970), the era of corporate scandals ushered in a focus on enlightened self-interest, CSR, charity, and ethical duties of business to society (Carroll & Buchholtz, 2014).

Corporate social responsibility (CSR) focuses on one subset of stakeholders considered in the stakeholder theory, namely the community. Much as with

definition of sustainability, there is no one universally-accepted definition of corporate social responsibility (CSR). Instead, researchers in this field developed a wide array of concepts and ideas under the umbrella of CSR. Such related concepts include corporate social responsiveness (Ackerman, 1975; Sethi, 1975; Ackerman & Bauer, 1976), corporate social performance (Carroll, 1979; Wartick and Cochran, 1985; Wood, 1991), corporate citizenship (Wood & Logston, 2001; Waddock, 2004); corporate governance (Jones, 1980; Freeman & Evan, 1990), and corporate social entrepreneurship (Austin, Stevenson, & Wei-Skillern, 2006; Mair & Marti, 2006).

In general, the concept of CSR can be understood as a business model that helps a company be accountable to society. Research suggests that CSR can be good for business, finding a positive relationship between social and financial performance (McWilliams and Siegel, 2001; Orlitzky, Schmidt, & Rynes, 2003). Correspondingly, companies that benefit society via corporate philanthropy and volunteering can, at the same time, boost their own brand reputation (Carrol, 1991; 1994; 1999).

Carroll (1979; 1991) developed an influential CSR pyramid model, which provides four dimensions or categories of social responsibilities of business, namely:

- economic responsibilities to profitably produce and sell goods and services society wants,
- legal responsibilities to comply with current laws and regulations,
- ethical responsibilities to go beyond economic and legal requirements and fulfil the expectations of society, and
- discretionary or philanthropic responsibilities to give back to their community and support causes society cares about on a voluntary basis.

A main criticism of CSR is that it artificially reinforces a separation between business, ethics and society. In short, CSR models treat social responsibilities as add-ons to existing financial responsibilities and keep them from the strategic purview of managers.

What is most pertinent, however, is that ethics which support CSR are embedded in an organizational context, namely in corporate cultures and climates (Carroll & Buchholtz, 2014; Frederick, 2006). As such, these elements must be carefully discovered, measured and managed.

Theoretical Frameworks from Organizational Behavior

Organizational culture.

Each organization has its own unique culture, its own organizational DNA consisting of shared values, beliefs, attitudes and behavioral norms. It can be thought of as an invisible glue that holds organization together and influences organizational actions and approaches to conducting business. Organizational culture, sometimes referred to as corporate culture, is colloquially referred to as "how we do things around here". Barney (1986), who argues that organizational culture can be a potent source of sustained competitive advantage, defines organizational culture as, "a complex set of values, beliefs, assumptions, and symbols that define the way in which a firm conducts its business" (p. 657).

Yet, another organizational scholar views this construct in terms of integration, differentiation and fragmentation (Martin, 1992). From the integration perspective, an organizational culture is that of sharedness, and clarity, consistently reinforcing the same themes. Conversely, viewed from the differentiation perspective, consensus exists only within the boundaries of subcultures which often clash due to the ambiguity and inconsistencies running between them. Lastly, from the fragmentation perspective, ambiguity is seen as an essence of organizational culture (Martin, 1992).

A more elaborate definition offered by Schein (1999) describes organizational culture as a three-level construct, based on the principle of visibility. The most observable level, referred to as artifacts, consists of visible and tangible manifestations of the culture. For example, the office layout demystifies some part of the organization's culture. The second level, espoused values, gives cues regarding the first level. An organization can value teamwork and open communication, for example, which is represented in their open office layout and can be easily identified by its members. Completely hidden or invisible is the third and final level of organizational culture, termed underlying assumptions, which suggests that members of an organization operate according to some implicit values. Employees share these underlying assumptions, which typically come from the founder's values, to give tacit guidelines for appropriate work behavior. In short, organizational culture can be defined as the shared basic assumptions about the world, and core values guiding organizational life (Schein, 2010).

The role of leadership is inextricably linked to organizational culture, as leaders often set core values. Schein (2010) argues that leaders embed and transmit culture via six primary mechanisms, namely: deliberate role modeling; allocation of rewards and status; human resource practices such as, recruitment, selection, promotion, and expulsions; allocation of resources; reactions to organizational crises; and simply by what leaders pay attention to and measure on a regular basis.

These tools are seen as visible artifacts of emerging culture which together create organizational climate (Ashkanasy, Wilderom, & Peterson, 2000). Leadership needed for sustainability simultaneously values people and promotes sustainable strategy (Eccles, Miller-Perkins, & Serafeim, 2012). Research generally supports the notion that leadership and organizational culture are essential for development of sustainable enterprises (Baumgartner, 2009; Bertels, Papania, & Papania, 2010; Eccles et al., 2012; Epstein et al., 2010). Tui and colleagues (2006) found that leaders can build strong cultures, not only by articulating vision and showing energy, but also by building strong organizational systems in the background. Research generally supports the link between strong culture and organizational effectiveness (Lee & Yu 2004). Similarly, research suggests that the behavior of leaders has a great potential to impact related construct termed organizational climates (Kuenzi & Schminke, 2009).

While culture is thought of as difficult to change due to its historical and implicit nature, climate is more flexible and malleable to changes (Denison, 1996), especially via behavior of immediate supervisors (Schein, 1999). Whereas organizational culture is often studied via qualitative methods, climate research favors quantitative surveys of employee shared perceptions which allow focus on strategic outcomes (e.g., safety, service, innovation) related to organizational

success (Schneider, 1975). Organizational climate is the most pertinent theoretical framework for the present study.

Organizational climate.

Organizational climate and organizational culture are closely related constructs used for conceptualizing the way people experience their work settings (Denison, 1996). While culture can be thought of as a bundle of basic assumptions and values that guide organizational life, organizational climate can be viewed as the shared perceptions of experiences in the organizational setting and the meaning attached to them (Schneider, Ehrhart, & Macey, 2011). More specifically, climates are shared perceptions of policies, practices, and procedures that an organization expects and promotes (Schneider & Reichers, 1983; Kuenzi & Schinke, 2009). Climate research initially focused on individual-level or psychological climates, as opposed to organizational climates. Psychological climate refers to an individual's perceptions of the environment and its meaning to the individual (James & Jones, 1974, Jones & James, 1979). Because psychological climates reflect the evaluations of experiences at work by the individual (James & Jones, 1974), their measures relate to other individual-level constructs (e.g., individual's well-being) more than they relate to unit-level outcomes (James & James, 1989; Schneider, Ehrhart, & Macey, 2011).

Today, climate has been defined and measured in terms of the organizational level, rather than the individual level (Schneider, Ehrhart, & Macey, 2011), and represents the collective perception of the work environment (Kuenzi & Schminke, 2009). While organizational climates are still measured at the individual level, the individual responses are aggregated based on the level of consensus to the organizational, or unit, level (Kuenzi & Schminke, 2009). Organizational climate questionnaires consist of items aimed at the unit or organizational level, assess organizational as opposed to individual functioning, and are focused on important organizational outcomes (Glick, 1985).

Historically, research on organizational climates began with general, holistic or global climates for well-being and was heavily focused on leadership styles (Lewin, Lippitt, & White, 1939). This approach was later criticized for a lack of precision in definition, methodology, and theoretical basis (Kuenzi & Schminke, 2009; Schneider, Ehrhart, & Macey, 2011). More recently, researchers found that a specific or focused climate measure designed to assess a narrower bandwidth resulted in more reliable measurement (Schneider, Ehrhart, & Macey, 2011). These climates are referred to as strategic, in that they focus on a specific desired organizational outcome (e.g., customer service). An example of a well-researched strategic climate area relevant to sustainability climate is focused on safety and aptly labeled as safety climates (Zohar, 2000).

Safety climates. Safety is one of the key organizational concerns across a variety of industries and, as such, many firms wish to predict and influence safety outcomes (Zohar, 2011; 2014). An organizational safety climate reflects the extent to which employees perceive that organizational policies and procedures support safety practices over other competing goals, such as speed (Zohar, 2000). The specific desired outcome for a strategic organizational safety climate is prioritizing safety practices over other competing goals to decrease the prevalence of accidents.

Safety policies and procedures instituted by an organization, such as quality of safety training and hazardous material maintenance protocol, guide employee behavior (Zohar, 2000), as do examples of supervisory practices (Zohar & Luria, 2004). Research evidence consistently shows that when safety climates are favorable, employees are more likely to engage in behaviors that promote safety, which lead to fewer accidents or injuries (Clarke, 2006; Christian, Bradley, Wallace, & Burke, 2009; Schneider & Reichers, 1983; Zohar, 1980).

Zohar (1980) identified the following eight dimensions of safety climate focused on organizational policies and procedures: perceived importance of safety training programs; perceived management attitudes towards safety; perceived effects of safe conduct on promotion; perceived level of risk at the workplace; perceived effects of required work pace on safety; perceived status of safety officer;

perceived effects of safe conduct on social status; and perceived status of safety committee. The major implication of the study was that management commitment to safety was identified as a major determinant of success of safety programs in an industry.

In a related study, Zohar (2000) focused on group-level safety climate, as opposed to the organizational level described above. In this study, climate perceptions involving supervisory safety practices in a manufacturing context were examined using longitudinal design. Examples of climate items include "My supervisor says a good word whenever he/she sees a job done according to the safety rules", and "My supervisor seriously considers any worker's suggestions for improving safety". The study found that safety climate perceptions significantly predicted accidents during the 5-month period.

This move, away from simple check-listing of organizational policies, reflects the current thinking in climate literature. Indeed, supervisory behavior is now the focus of such research. In an organizational setting, subordinates tend to take cues from supervisors about what is valued and prioritized (Zohar, 2003). Consistency of leaders' messages and practices experienced by subordinates gives rise to shared strategic climate perceptions (Zohar & Tenne-Gazit, 2008). Agreement of individual climate perceptions among subordinates (or lack thereof),

referred to as climate strength, reflects perceived priority of the strategic outcome such as employee safety (Zohar & Tenne-Gazit, 2008).

As disscussed earlier, good safety climates are associated with lower accident rates (Zohar, 2000) and therefore associated with better sustainability in the workplace (OSHA, 2016). Advancing worker safety falls under the social aspect of TBL sustainability (OSHA, 2016). Therefore, safety climate literuature has both theoretical and practical relevance to the development of the TBL SOS Climate.

Strategic Organizational Sustainability Climate. Strategic organizational sustainability climate can then be viewed as shared perceptions of policies, practices, procedures, and behaviors, specifically concerning triple bottom line sustainability, that are supported and rewarded in a given organization (Hall, 2005; Arnaud & Sekera, 2010; Arnoud et al., 2013).

Research in this area suggests that strategic or focused climates which can be assessed via quantitative methods are superior in prediction of specific organizational outcomes (Schneider et al., 2013). Measures of sustainability-focused climate will improve our understanding of the work context that will likely yield such a strategic climate, as well as suggest specific practices that might serve as interventions to enhance performance in the three sustainability areas.

Although a number of sustainability focused organizational climate measures have been developed (Hall, 2005; Arnaud, Tinoco, & Rhoades, 2013; Norton, Parker, Zacher, & Ashkanasy, 2015), all of these measures suffer from significant deficiencies. First, each of these measures addresses at the most one or two aspects of TBL sustainability climate. In other words, none of them measures the actual TBL sustainability climate. In addition, authors fail to distinguish organizational climate from organizational culture as defined in the organizational behavior literature, thereby introducing conceptual ambiquity (Schneider & Barbera, 2014).

One example of such a measure was developed by Arnaud and colleagues (2013). The current version of this 17-item measure, however, presents several issues related to its reliability and validity. The three dimensions of their Climate of Sustainability Survey, namely sensitivity to sustainability, motivation for sustainability, and responsibility for sustainability, mix several distinct constructs together, which does not amount to a coherent definition of organizational sustainability climate. Closer examination reveals that, for example, motivation for sustainability dimension, which has six items (“altruism”, “conservationism”, “environmental performance”, “protecting the environment”, “protecting the welfare of all living things”, and “unity with nature”) assessed on five-point Likert scale (ranging from not important at all to very important) taps perceptions of

values and beliefs and not perceptions of policies and practices within an organization (i.e., organizational climate). This further adds to the construct validity issues.

While defining sustainability as a three-dimensional construct, items for the remaining two dimensions do not explicitly tap social and economic sustainability dimensions and, as such, are not balanced vis-à-vis economic, social and environmental aspects. This presents an issue related to content validity. Lastly, this measure was designed and validated using only very small samples (n=47, and n=67 respectively) which are generally unsuitable for performing factor analyses (Stevens, 1996).

Another example of an existing sustainability climate measure is the sustainability climate survey developed by Hall (2005). This 21-item measure includes a mix of culture and climate constructs, such as, employee involvement, sustainability norms, administrative support, rewards, and shared vision. There is no clear definition of sustainability climate provided and as such both organizational climate and organizational culture related variables are mixed in this measure. While claiming to follow the TBL sustainability definition, the items of this measure do not cover all three pillars of sustainability (economic, social, and environmental). As such, this measure exhibits several validity issues. While the

author attempted to develop and validate this measure for general use, the size and the nature of the sample used in the process (full and part-time university employees mainly from the facilities department) precludes generalizability as it relates to findings.

Lastly, an 8-item measure of green work climate perceptions (Norton, Zacher, & Ashkenasy, 2014) includes two subscales, one referring to perceptions of organization and the other referring to perceptions of coworkers. While reported reliability and validity were at acceptable levels, this scale covers only the climate perceptions related to environmental dimension of sustainability construct and neglects to cover the other two dimensions (social, and economic).

Based on a review of largely practitioner literature (BCG, 2017; Bertels et al., 2010; Davis-Peccoud, Allen & Artabane, 2013; Hall, 2005; Howard-Grenville, Bertels, & Lahneman, 2014; Kuijpers, & van Rooijen, 2016; Norton, Parker, Zacher, & Ashkanasy 2014; PwC, 2017; Ramus & Steger, 2000; Zibarras & Coan, 2015), the following content dimensions of sustainability climate measure were identified:

1. Top Leadership Support

   The extent to which employees perceive that organizational leadership is dedicated to the triple bottom line sustainability.

2. Sustainability Strategy

   The awareness of the existence of sustainability strategy and companywide goals and targets towards environmental, social, and economic performance by employees.

3. Sustainability Communication

   Employees' perception of the effectiveness of communication regarding triple bottom line sustainability.

4. Sustainability Training and Development

   The extent to which employees perceive that the triple bottom line sustainability training provided is sufficient to inform them on how to work sustainably.

5. Sustainability Metrics and Reporting - voluntary sustainability standards

   The awareness of the existence of a companywide sustainability metrics and published sustainability report.

6. Modeling Behavior - both top-down and bottom-up (by supervisors and coworkers)

   Employees' appraisal of the extent to which their fellow coworkers/supervisors are committed to triple bottom line sustainability in the workplace.

7. Allocation of Resources

The process of dividing up and distributing available, limited resources to economic, social, and environmental initiatives.

8. Rewards and Recognition (individual and team incentives)

   Employees' perceptions of the extent to which triple bottom line sustainability behaviors are reinforced and supported by the organization.

9. External Sustainability Partnerships

   The awareness of the existence of collaborative sustainability programs involving the industry partners, customers, suppliers, NGOs, and governmental entities by employees.

10. Internal Sustainability Collaboration

    The awareness of the existence of collaborative sustainability programs involving employees.

In summary, the better the organization's policies, practices, and procedures are in consistently relaying the message that TBL sustainability is a priority, the better TBL SOS climate will be (Hall, 2005; Arnaud & Schinke, 2013). For example, the organization may integrate TBL sustainability into its strategic planning, personnel decision-making (including recruitment, selection, training, evaluation, and compensation), and organizational communication. Improved TBL SOS Climate, as a result of such integration, has the potential to impact employee

day to day work behaviors and routines, which in turn will have the potential to make the organization more sustainable.

Chapter 3
Methodology

Overview

The purpose of this dissertation was to develop and validate a new scale for a construct called Strategic Organizational Sustainability Climate (SOS Climate) from a triple bottom line sustainability perspective. To this end, the SOS Climate Scale was developed and validated across three phases, following recommendations and steps outlined by Hinkin (1995), Spector (1992), and DeVellis (2003).

In Phase 1, an extensive literature review and a series of personal face-to-face and phone interviews with Sustainability Officers or Managers were conducted to generate preliminary construct dimensions and to assist in generating a pool of items (see MacKenzie, Podsakoff, & Podsakoff, 2011). Given the nature of the study, it was important to first gather existing organizational sustainability management practices from sustainability managers before gaining employee perceptions of these practices; hence the sample. In this phase, generated items were reviewed and pre-tested for face and content validity (the extent to which the items identified in the study reflect the domain of the concept being measured) by

subject matter experts (SMEs) in preparation for Phase 2 (pilot study), and 3 (main study); which was used to validate the newly developed scale.

Research Questions

This study is guided by the following two research questions:

1) What is the strategic organizational sustainability climate?
2) How can we measure this construct?

Phase 1: Instrument Development

Construct definition.

According to Spector (1992), the most important phase in the scale-development process involves defining the construct of interest. Following a recommendation by Spector (1992), an inductive (versus deductive) approach for scale development was used. As discussed earlier, for the purpose of this dissertation, SOS climate is defined as: *Employee perceptions of practices, procedures, and behaviors conducive to triple bottom line sustainability that are rewarded and supported in a given organization.*

The next step involved conducting a systematic literature review and SME interviews. The literature review served two purposes. Firstly, it helped to explore and critique existing measures of constructs similar to SOS climate. Secondly, the

review provided initial categorizations of SOS climate domains, which aided in the development of interview questions. The ultimate goal of the literature review and interviews was to provide a foundation for dimensions of the SOS climate upon which a large pool of survey items can be generated.

To access the relevant literature, an online search of the latest empirical quantitative and qualitative research articles in peer-reviewed journals, as well as white papers published by business consulting firms, on sustainability, triple bottom line, sustainability management, sustainability practices and programs, and organizational sustainability climate, was conducted via relevant databases, namely:

- Business Source Complete (EBSCOhost)
- ProQuest
- Emerald Insight
- ProQuest Dissertations & Theses Global
- Global Electronic Thesis and Dissertations Search
- Google Scholar

- Accenture, Bain & Company, Deloitte, KPMG, McKinsey & Company, PwC, and Booz Allen Hamilton websites

Specifically, the terms “organizational sustainability climate”, “triple bottom line” “sustainability management”, “sustainable management”, “corporate social responsibility management”, “corporate responsibility management”, “corporate citizenship” and “practices”, “policies”, “systems”, “programs”, “strategies”, “organization”, “business”, and “company” were searched for in the title, keywords, and abstracts. The search was limited to research published in the last 25 years in English-language publications. This time frame was deemed adequate because the concept of sustainability as TBL was established by Elkington (1994). Categories were narrowed down to include management, business, strategic management, industrial-organizational psychology, organizational behavior, and business ethics.

Qualitative research was reviewed to explore the conceptualization of organizational sustainability climate. Since the focus of this study was on developing a quantitative measure of TBL SOS climate, quantitative research was reviewed for existing measures of similar constructs. A table showing the list of existing scales related to the SOS climate construct is provided (see Appendix D).

Qualitative semi-structured interviews.

In the qualitative phase, the phenomenological approach to understanding the nature (or the essence) of strategic organizational sustainability climate phenomena in organizations across private, public, and non-profit sectors was used. According to Creswell and Poth (2018), this approach recommends collecting data from individuals knowledgeable about the phenomenon via interviews, accompanied by analyzing data by focusing on what all participants have in common regarding lived experiences of a phenomenon, highlighting significant sentences and quotes, and combining them into coherent themes.

Sample and procedures.

After obtaining IRB approval, participants were identified via sustainability-related professional associations and personal networking. Criteria for inclusion in the sample were a minimum of one year of full-time work experience in a sustainability-related management role in the private, public, or third sector organization. Official letters explaining the purpose of the study (including informed consent) and requesting participation were sent to sustainability professionals such as sustainability coordinators, officers, or managers (see Appendix H). Following positive responses, interviews were arranged either in person or via phone at a time convenient to the interviewee.

Interviews lasted approximately 35-45 minutes. Interviewees were given the opportunity to ask any questions pertaining to the research or interview at any point before, during, and after the interview. Participants were asked questions pertaining to practices of TBL sustainability within their organizations. All interviews were recorded with the permission of participants and notes were also taken (see Appendix B for interview protocol). All interviews were conducted and transcribed by the researcher. Given the exploratory nature of this phase of research, the sample size of 10 was deemed suitable for gaining preliminary insights into the issues of interest, finding preliminary dimensions of the SOS climate construct and generating suitable items for measuring SOS climate construct. The interview process was concluded after category saturation was reached, at which point no more new information was gained from additional interviews (Lincoln & Guba, 1985; Patton, 2001).

Interviewee tenure in the organization ranged from 14 years to 1 year. In terms of gender and age breakdown, there were five male and five female interviewees with age brackets ranging from 20-30 to 50-60. Among participant job titles were Global Senior Director of Environmental Health and Safety, Executive Director, and Sustainability Programs Manager. See Appendix H for detailed demographic information.

Data analytic technique.

Content analysis. Following the qualitative data collection stage, content analysis with a priori coding scheme (10 dimensions found in the literature) was employed to analyze the qualitative interview data. This process involved line-by-line analysis of transcripts and the labeling of phenomena. NVivo qualitative data analysis software Version 12 was used. The prior established ten content dimensions from the literature served as the coding categories. Careful revisions were made to ensure mutual exclusivity and exhaustiveness (Weber, 1990). The findings supported all but one of the preliminary dimensions found in the literature; the Rewards and Recognition dimension was not found to be practiced. However, because all interviewees mentioned it as a helpful addition to their current sustainability practices, it was kept for further analysis. Additionally, the findings allowed for some dimensions to be combined. The initial ten dimensions of Top Leadership Support, Sustainability Strategy, Sustainability Communication, Sustainability Training and Development, Sustainability Metrics and Reporting, Modeling Behavior, Allocation of Resources, Rewards and Recognition, External Sustainability Partnerships, and Internal Sustainability Collaboration were revised as follows: Top Leadership Support was combined with Allocation of Resources,

and Sustainability Strategy was combined with Sustainability Metrics and Reporting. With the rest of the dimensions remaining the same, the final SOS Climate model included a total of eight dimensions.

Item generation.

The results of analysis of the interview data provided the foundation upon which items were generated to measure each subdimension of the TBL (economic, social, and environmental) within the eight SOS Climate dimensions (Top Leadership Support, Corporate Sustainability Strategy, Sustainability Communication, Sustainability Training and Development, Modeling Behavior, Rewards and Recognition, External Sustainability Partnerships, and Internal Sustainability Collaboration). This stage of scale development involved choosing the number and the nature of the response choices (5-point Likert scale agreement response choice was selected ranging from 1- strongly disagree to 5- strongly agree), item writing to assess the construct of the SOS Climate, as well as writing instructions for the respondents (Spector, 1992). The special instructions addressed two issues. Firstly, they provided directions for using the scale (e.g., Using the below scale, please indicate the extent to which you agree with each of the following statements: *My organization shows commitment to sustainability by ...*). Secondly, they provided information about the specific construct, in this case the

SOS Climate (e.g., the current study has been designed to examine the practice of triple bottom line sustainability or balancing economic, social, and environmental performance in organizations).

The following guidelines and best practices by Hinkin (1998), Fowler (1995) and Spector (1992) were utilized during item writing process:

- statements should be simple and as short as possible, and the language used should be familiar to target respondents (avoid jargon, expressions, and colloquialisms);
- items should address only a single issue ("double-barreled" items, such as "My supervisor is intelligent and enthusiastic" should be avoided as such items may represent two constructs and confuse respondents);
- leading questions should be avoided, as they may bias responses;
- items that all respondents would answer similarly should not be used, as they will generate little variance;
- carefully consider the use of negatively worded, reverse-scored items (they must be very carefully worded to assure appropriate interpretation by respondents, and careful attention should be paid to factor loadings

and communalities at the factor analytical stage of scale development); and

- avoid using negatives to reverse the wording of an item as negatives are easily missed by respondents (for example, "I am *not* satisfied with my job").

Following the best practices in the item writing, five to ten items per dimension were generated (Hinkin, 1998; Spector, 1992). In total, 150 items were developed. At this point, the goal was to develop items that will result in a measure that samples the theoretical domain of interest to demonstrate content validity.

Scale refinement.

Following the generation of a large pool of items, these items were subjected to an assessment of face and content validity. Content validity assesses whether items represent the entire content domain of a construct, while face validity assesses the (re)presentation of these items (Hardesty & Bearden, 2004). A common method for assessing the face validity involves judgment of items by subject matter experts, who judge each item according to the extent to which it represents the given construct. Based on the review and item sorting to categories by five subject matter experts (two faculty members and three doctoral students),

141 items which were correctly categorized into the intended dimension were retained.

Pre-testing of quantitative online survey.

The purpose of this step was to further assess the relevance and importance of the factors identified in the face-to-face and phone interviews with a broader sample.

An online quantitative survey was pre-tested by two faculty members and two doctoral students who assessed whether the survey questions were clear and easily understood. Revisions to item wording and instructions were made based on the results of the pre-test.

Phase 2: Pilot Study

The goal of this step was to produce a tentative version of the scale, one that is ready for subsequent validation study including reduction of items in each dimension and obtaining a preliminary structure for the SOS Climate Scale. In this step, the first draft of the measure was administered online to a large sample of participants found via Amazon's (AWS) Mechanical Turk (MTurk), a crowdsourcing marketplace enabling access to a diverse set of research participants (Litman & Robinson, 2020). Subsequently, principal component (PCA) analysis

was conducted. This type of analysis requires a sample size of 150-200 participants (Spector, 1992). The survey was administered online via Qualtrics, a third-party survey administrator to N=400 participants. The items were presented based on their dimension. Their order of presentation within each dimension was randomized to counteract any order effects (Schriesheim, Kopelman, & Solomon, 1989). The survey also included demographics such as gender, age, and industry. Lastly, two attention checks (items such as "You must respond to this item with strongly disagree") were also included within the survey in order to eliminate unmotivated participants (Huang, Curran, Keeney, Poposki, & Deshon, 2012). IBM SPSS statistical software Version 26 was used to conduct exploratory factor analysis.

Factor analysis (FA), using IBM SPSS Version 26 statistical software, was used to analyze the data. FA was selected for the data analysis because it is used extensively in scale development research (Spector, 1992; Stevens, 1996). It is specifically used to refine and reduce a large number of generated scale items and questions to more manageable number of coherent subscales (Tabachnick & Fidel, 2007). In an early stage of research, the exploratory factor analysis (EFA) is recommended to explore the interrelationship between a set of variables (Tabachnick & Fidel, 2007).

To explore the underlying structure of SOS Climate scale, an exploratory approach to factor analysis and specifically principal component analysis (PCA) was used on the pilot study sample at this stage. See Appendix I for pilot study sample demographics. Following the best practices by Spector (1992) and Tabachnick & Fidel (2007), prior to conducting the analysis, the data set was cleaned and screened for missing data and outliers. Additionally, the assumptions of sample size, factorability of the correlation matrix using the Bartlett's test of sphericity (Bartlett, 1954), and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy (Kaiser, 1970), multivariate normality, and linearity were assessed and no violations were found that would preclude further analysis. Next, factor extraction method was selected. The most widely used principal component analysis (PCA) was utilized in this study (Spector, 1992). Extraction refers to the process of deciding how many factors are meaningful and should be retained. Eigenvalues, which represent the amount of variance explained by a factor, and a scree plot were examined in order to decide how many factors to keep at this stage. Following factor extraction, the next step involved factor rotation and interpretation. Factor rotation is a process by which factors are rotated along axes in order to provide the solution, the pattern of factor loadings, in a format that is easier to interpret (Tabachnick & Fidel, 2007). There are two approaches to rotation: orthogonal (assumes uncorrelated factors) and oblique rotation (assumes correlated

factors). According to the recommendations by Field (2018), analyses were conducting applying both types of rotation. Specifically, the most widely used orthogonal rotation technique, the Varimax, and the most widely used technique for the oblique rotation, the Direct Oblimin, were applied to the data set (Field, 2018; Tabachnick & Fidel, 2007, Stevens, 1996). The goal of this process was to achieve a clean factor structure in which each of the variables loads strongly on one component only and with each component consisting of a set of variables with strong loadings.

The clean factor structure revealed three components. Inspecting the content of the variables loading on to each of the components revealed that those components separated based on economic items, environmental items, and social items respectively. This development warranted the reconceptualization of the climate instrument, according to the three TBL sustainability (Elkington, 1997) dimensions of economic, environmental, and social. Each TBL SOS Climate dimension was comprised of two sub-dimensions. The economic dimension was comprised of 7 items reflecting "reducing risk" and "focusing on the long-term success" sub-dimensions; the environmental dimension was comprised of 11 items reflecting "finding alternatives" and "minimizing negative impacts" sub-dimensions; and the social dimension was comprised of 7 items reflecting "donating resources" and "promoting community service" sub-dimensions. No new

items were written, as each TBL SOS Climate dimension was comprised of items written for the original 8 dimensions. A full list of items with their sub-dimensions is provided in the Appendix F.

The value of the pilot study lay in reducing number of items and revealing a structure upon which interpretation of the scale dimensionality was possible. The pilot study indicated that instead of measuring SOS Climate using the 8 dimensions with items tapping each of the three aspects of TBL, it will be more useful and scientifically sound to measure the same construct using three TBL dimensions with items written for 8 aspects. It is important to note that the same construct is measured either way.

Lastly, reliability of the scale was assessed. Cronbach's coefficient alpha, the statistical index of internal consistency reliability (Spector, 1992), was utilized. Internal consistency reliability refers to the degree to which items in the scale are all measuring the same underlying construct. Cronbach's alpha provides information about the average correlation between all the items in the scale (Cronbach, 1951). Coefficient values range from 0 to 1 with a minimum acceptable level of 0.7 (Nunnally, 1978). Alphas computed for each of the latent SOS Climate dimensions of environmental sustainability, social sustainability, and economic sustainability were 0.95, 0.89, and 0.84, respectively.

To summarize, following the PCA, the SOS Climate Scale was reconceptualized and scale items were revised in the following manner:

A) Based on the PCA results, scale was revised to reflect the three-factor model solution with environmental, social, and economic factors;

B) 25 variables (items) with the highest loadings on those three factors were retained for further analysis;

C) 2 items originally written for "Modeling Behavior" dimension were reworded to match the item stem "My organization" instead of "My coworkers"

The goal of this phase was to provide a theoretically and practically sound measure of the SOS Climate for the instrument validation phase. In the next section, the details on procedures related to the main study are provided.

Phase 3: Main Study

Any scientific instrument must be both reliable (consistent) and valid (accurate) in order to provide useful measurement. The validity of a measurement instrument refers to the degree to which it measures the variable which it was designed to measure. While validity is a unitary construct, there are different sources of validity evidence that should be collected to support inferences made

from the measurement and use of the instrument (Messick, 1989). The scale validation process then consists of gathering empirical evidence for its intended use.

According to Spector (1992), factor analysis and specifically confirmatory factor analysis (CFA) is commonly used to conduct scale or questionnaire validation. While recommendations vary, this type of statistical analysis generally requires large sample size of 150 or more participants (Netemeyer et. al., 2003; Spector, 1992). Data for this phase was collected from a sample of full-time employees selected from a cross-section of public, private, and nonprofit sector organizations. Participants were recruited using the Amazon (AWS) MTurk. A final questionnaire with a total of 25 items, on a 5-point Likert scale with responses ranging from 1-strongly disagree to 5-strongly agree, together with relevant demographic questions, was administered online via the third-party survey platform Qualtrics to N=500 participants.

Confirmatory factor analysis (CFA) was conducted using R, an open source statistical software for data science, Version 4.0.0 with RStudio IDE, an integrated development environment for R, Version 1.2.5042, and the Lavaan R package for Latent Variable Analysis Version 0.6-6. Estimator method used was Maximum Likelihood (ML). Confirmatory factor analysis (CFA) was used to test the

theoretical measurement model and to confirm a priori hypothesis about the relationship between a set of scale items and their corresponding factors. While earlier PCA was used to explore dimensionality of the SOS Climate Scale, CFA was used at this stage to test (confirm) the hypothesized 3-factor model of the SOS Climate. The maximum likelihood estimation (MLE) was used as a primary form of model estimation. The theoretical factor structure was specified and tested for its fit or degree of correspondence with the observed covariances between the items in the factors (See Figure 1). Typical criteria used to evaluate CFA models, such as model convergence, fit indices, significance of parameter estimates, standardized residuals and modification indices, were utilized. After the solution converged, model fit was assessed.

Table 1 provides a list of commonly used model fit indices and associated thresholds according to Tabachnick and Fidel (2007).

Table 1: Model fit indices and recommended thresholds

Index	**Abbreviation**	**Threshold**
Chi-square	χ^2	χ^2 /df < 2
Comparative fit index	CFI	> .95
Tucker-Lewis index	TLI	> .95
Normed fit index	NFI	> .95
Akaike Information Criterion	AIC	Smaller is better
Consistent Akaike Information Criterion	CAIC	Smaller is better
Root Mean Squared Error of Approximation	RMSEA	≤ .06
Root Mean Square Residual	RMR	Smaller is better
Standardized Root Mean Square Residual	SRMR	≤ .08

CFA was used to indicate how well survey data fits the hypothesized factor structure (Nunnally, 1978; Stevens, 1996; Tabachnick & Fidell, 2007). At this point, CFA confirmed the results of PCA from the pilot study on a new organizational sample.

Additionally, as in the pilot study, test of reliability was performed for the overall scale as well as for each of the three SOS Climate Scale dimensions. Again, the Cronbach's alpha coefficient was used to assess internal consistency reliability with a threshold value of 0 .70, as suggested by Nunnally (1978). Cronbach's alpha for the overall scale was .95. Cronbach's alphas for economic, social, and environmental sustainability climate dimension were .86, .90, and .94, respectively.

While this chapter provided details on research methodology for the three phases in scale development and validation, the following chapter provides the results for each phase, as well as the summary of key findings.

Chapter 4
Results

The purpose of this study was to advance our understanding of the TBL strategic organizational sustainability climate by identifying and measuring organizational characteristics pertinent to long-term business viability in the current era. This purpose was achieved by conceptualizing and providing a diagnostic measurement tool for this construct. The following sections describe the findings from each phase of the research, followed by a summary of the results.

Phase 1: Instrument Development Results

In the first phase of scale development, following the literature review, qualitative data was collected via semi-structured interviews using a phenomenological approach. Subsequently, content analysis of qualitative data was performed to assess the validity of the preliminary definition of the SOS Climate. A semi-structured interview format allowed for a follow-up questions to encourage clarification and elaboration when necessary. In this way, the likelihood of an interviewee omitting critical details was reduced.

Participants. 10 individuals, sustainability professionals, responsible for sustainability in their respective organizations participated in face-to-face or phone interviews. One of the participants provided written answers. Appendix B provides

full interview protocol. 50% were male. Participants age range from 20-30 to 50-60 years. Their tenure ranged from 14 years to 1 year. A full demographic information is provided in the Appendix H.

Results of Content Analysis

While initial literature review revealed preliminary theoretical dimensions of the SOS Climate, an inductive phenomenological approach was used with the qualitative data to ensure the research does not overlook important themes (Hinkin, 1998). Initial background theory guided categorization of phrases, sentences, and paragraphs of the textual data from interview transcripts. An "Other" category was added to capture statements which did not fall into pre-determined categories from the literature review. To facilitate the coding process and content analysis, NVivo qualitative data analytic software, Version 12, was utilized. Content analysis involves classifying a large textual data into a smaller number of content categories (Weber, 1990). Accordingly, interview transcripts were coded for 10 pre-existing categories plus the "other" category, assessing frequency as well as occurrence across 10 interview transcripts.

For example, consider the following quote:

"We have great support from our CEO, he is very interested in sustainability and very supportive of the programs. He really pushed us to do more, to look at our

programs and figure out how can we do more, how can we save more energy, how can we look at our campuses and instead of putting in solutions for each building put in solutions for whole campuses. To look at new technologies and come up with new ways to power our facilities, and to save water."

The statement above illustrates the significance of the top-leadership support category.

Another quote:

"We are doing many things and the challenge is that some of the projects and sustainable actions don't get recognized and giving people kudos for work well done goes a long way."

The statement above illustrates the importance of recognition for sustainable actions.

Another quote:

"Ultimate goal is to create a healthy environment and improve the quality of life for the community. This community garden project is a great success because the money we charge for rental of each garden bed goes back to the garden fund for the maintenance. ROI is there as fees cover the cost of building the garden and

then some. Over the course of 10 years we will be able to rebuild the garden and hopefully to build another one and create gardening program for the community."

The statement above illustrates the importance of strategy.

The scope of the SOS Climate construct with related sub-dimensions were refined as a result in the following manner. The findings supported all but one of the preliminary dimensions found in the literature; the Rewards and Recognition dimension was not found to be practiced. However, because all interviewees mentioned it as a helpful addition to their current sustainability practices, it was kept for further analysis. Additionally, the findings allowed for some dimensions to be combined. The initial ten dimensions of Top Leadership Support, Sustainability Strategy, Sustainability Communication, Sustainability Training and Development, Sustainability Metrics and Reporting, Modeling Behavior, Allocation of Resources, Rewards and Recognition, External Sustainability Partnerships, and Internal Sustainability Collaboration were revised as follows: Top Leadership Support was combined with Allocation of Resources, and Sustainability Strategy was combined with Sustainability Metrics and Reporting. With the rest of the dimensions remaining the same, the final SOS Climate model included a total of eight dimensions.

One of the side findings with regards to how sustainability is practiced in organizations, based on the interviews, relates to the fact that most interviewees indicated that their role was almost exclusively focused on environmental sustainability with only a minor focus on social and economic aspects. That means that social sustainability typically falls more under a purview of the human resource management and economic sustainability resides more with finance. One practical recommendation based on this finding is for sustainability managers to work on redefining their role to that of TBL sustainability managers.

Results of Item development

The next step involved item constructions and Q-sorting by a panel of subject matter experts. Using both the dimension definitions and statements from interviewees, all items were written to reflect one of the eight dimensions while also tapping each TBL sustainability aspect. In total, 150 items were written. The large pool of items was needed to enhance the scale's reliability, and to allow for detection of items in need of elimination (Spector, 1992). Out of original 150 items, 141 were correctly categorized into the intended dimension and were retained for the pilot study.

Phase 2: Pilot Study Results

Participants. 400 individuals working in the US across private, public, and non-profit organizations completed the 141-item survey on Amazon's MTurk platform. After cleaning and screening data for time to completion and attention checks, a total of 242 participants' data was retained for analysis. Of the 242 participants, 60.3 % were female, 39.7% were between 26 and 35 years of age, and 17.5% reported working in the professional service industry. Full demographic information is provided in the Appendix I.

Results of Principal Component Analysis.

In order to explore the underlying dimensionality of the scale, exploratory factor analytic technique principal component analysis (PCA) was utilized at this stage. PCA facilitated reduction of 141 variables into smaller linear combinations accounting for the maximum amount of variance, as well as provided empirical summary of the data.

The 141 items of the SOS Climate Scale were subjected to PCA using IBM SPSS Version 26. Prior to conducting PCA, the suitability of data for factor analysis was assessed. Inspection of a correlation matrix revealed the presence of many coefficients with values of 0.3 and above. The KMO value was 0.965, exceeding the recommended value of 0.6 (Kaiser, 1970). The Bartlett's Test of

Sphericity reached statistical significance, supporting the factorability of the correlation matrix (Bartlett, 1954; Tabachnick & Fidel, 2007).

Initial PCA with Direct Oblimin rotation revealed the presence of 18 components with eigenvalues exceeding 1, together explaining a total of 73% of the variance. A majority of items loaded strongly on the first component. As such, this solution did not add to factor cohesion nor did it aid in the item reduction process. Therefore, an 8-factor solution was specified in the next step.

Second PCA with Direct Oblimin rotation specifying an 8-factor solution explained 64.4 % of the variance however the first factor alone explained 52.4% of the variance.

As expected, a third PCA with Varimax rotation specifying an 8-factor solution provided virtually identical results as the Direct Oblimin rotation; this explained 64.6% of the variance but again the first factor alone explained 52.4 % of the variance.

After closely examining each item, the results showed that all items were clearly separated into and clustered according to the three aspects of triple bottom line sustainability, namely economic, social, and environmental and not according to the pre-established eight dimensions. A three-factor model turned out to be the best solution model. Pattern Matrix for PCA with items is provided in appendix K.

Based on these findings, the SOS climate model was reconceptualized and restructured in the following manner:

1) only the items with highest factor loadings (.4 or higher) for each of the three sub-dimensions of TBL sustainability climate were retained for further analysis,

2) items with the highest factor loadings on the economic sustainability component included items originally written for the dimension of "top leadership support" (example item: taking steps to minimize financial risks), and "strategy" (example item: having a solid plan for achieving financial sustainability goals),

3) items with the highest factor loadings on the environmental sustainability component included items originally written for the dimensions of "top leadership support", "strategy", "training and development" (example item: building internal workforce capabilities to effectively manage environmental sustainability risks and opportunities), and "rewards and recognition" (example item: recognizing individuals and teams who develop innovative ideas to improve the company's environmental performance), and

4) items with highest factor loadings on the social sustainability component included items originally written for the dimensions of "top leadership support", "rewards and recognition", "modeling behavior" (example item: donating money to charities and causes the company cares about), and "external collaboration and partnerships" (example item: routinely sponsoring charitable events), and

5) lastly, two items originally written for dimension of "modeling behavior" were reworded to match the item stem "my organization shows commitment to sustainability by" instead of their original stem "my coworkers show commitment to sustainability by" with final item wording *recognizing employees who* donate their time and talent to serve the community, and donating money to charities and causes *the company* cares about.

The full list of items under their new sub-dimensions is provided in the Appendix F.

A fourth and final PCA using Direct Oblimin rotation specifying a three-component solution showed clean structure with three factors with eigenvalues exceeding 1. Component 1 contributed 50.8 %, component 2 contributed 6.9 %, and component 3 contributed 4.6 % of the variance respectively.

Overall, the three- component solution accounted for a total of 62.3 % of the variance. Tables with Communalities, as well as Pattern Matrix, Structure Matrix, and Component Matrix are provided in the Appendix L. There was a strong positive correlation between component 1 (environmental sustainability), and component 2 (economic sustainability) with r =0.55, and a strong negative correlation between component 1 and component 3 (social sustainability) with r = -0.65, as well as between component 2 and component 3 with r = -0.58. Strong correlations between components supported the use of Direct Oblimin rotation. Based on these results, 117 items were eliminated. The final version of the SOS Climate scale for subsequent validation included 25 items.

Scale reliability analysis was also conducted. Cronbach's alphas for economic, social, and environmental sustainability climate dimensions were .84, .89, and .95, respectively.

Phase 3: Main Study Results

After completion of the pilot study and revisions made to the survey items based on the results, the final version of the SOS Climate Scale with a total of 25 items was administered online. Five demographic items were also collected (i.e., gender, age, employment status, tenure, and industry). The survey was administered using the third party software platform Qualtrics. The participants

were recruited using Amazon's AWS Mechanical Turk (MTurk) platform. MTurk participants were paid 25 cents to complete the ten-minute survey. The researcher specified that the participants must be in the United States, and responses to all items were required. A minimum time cutoff for survey completion of 2.5 minutes was imposed. Following recommendations by Hung, Curran, Keeney, Poposki, and DeShon (2012), cases that did not meet these criteria were removed to preserve the quality of the data.

Participants. 500 individuals working in the US across private, public, and non-profit organizations completed the survey on Amazon's MTurk platform. After cleaning and screening data and checking for the full-time employment status, a total of 185 participants' data was retained for analysis. Of the 185 participants, 50.8% were female, 40.5% were between 26 and 35 years of age, and 20.5% reported working in the manufacturing industry. 29.7% reported their organizational tenure between 1 and 3 years. Appendix J provides the full demographic information.

Results of Confirmatory Factor Analysis.

Confirmatory factor analysis (CFA) was conducted in order to confirm the factor structure from the pilot study on a new sample. A three-factor structure (See Figure 1) was specified prior to conducting CFA and a maximum likelihood

estimation (MLE) was used. In this manner, CFA was used to test the internal consistency and the validity of the measure (Netemeyer et al., 2003).

CFA supported the three-factor structure: χ^2 (272) = 510.360, p<.001, comparative fit index (CFI) = 0.920, Tucker-Lewis Index (TLI) = 0.912, AIC = 11111, BIC = 11282, root mean square error of approximation (RMSEA) = 0.069, and standardized root mean square residual (SRMR) = 0.058.

Additionally, the three-factor model showed a much better fit than a one-factor model: χ^2 (275) = 1117.462, p<.001, comparative fit index (CFI) = 0.718, Tucker-Lewis Index (TLI) = 0.692, AIC = 11712, BIC = 11873, root mean square error of approximation (RMSEA) = 0.129, and standardized root mean square residual (SRMR) = 0.103. Since the one-factor model does not meet the standards and cannot be used, the three-factor model was retained. Appendix N provides CFA factor loadings.

Scale reliability analysis was also conducted. Cronbach's alpha for the overall scale was .95. Cronbach's alphas for economic, social, and environmental sustainability climate dimension were .86, .90, and .94, respectively.

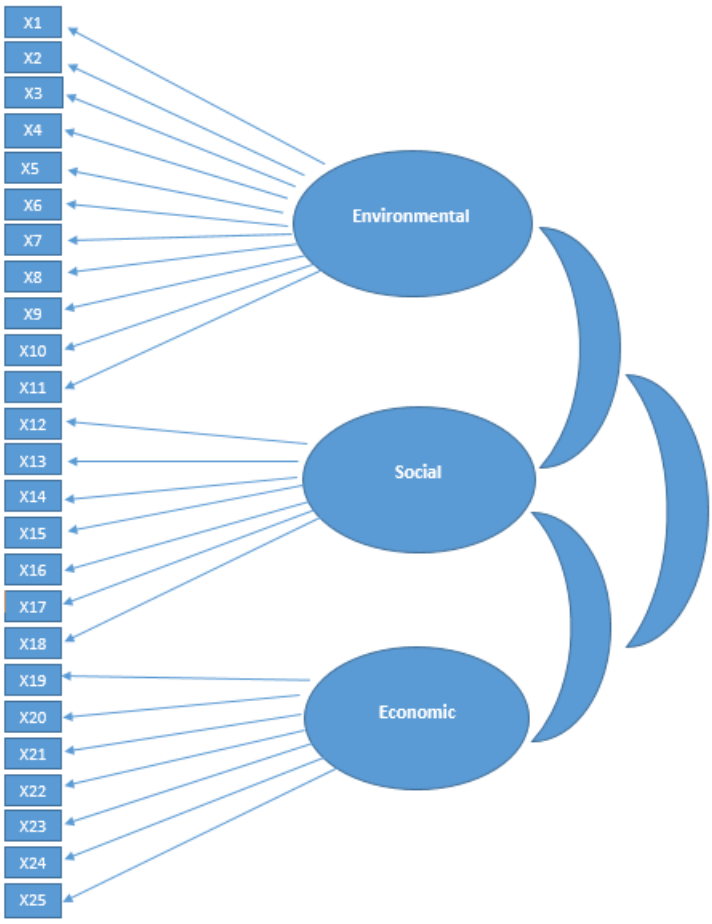

Figure 1: Theoretical model for CFA

Chapter 5
Discussion

The main goal of this research was twofold. Firstly, the goal was to conceptualize the construct of strategic organizational sustainability climate relying on the definition of organizational climates (Reichers and Schneider, 1990) and triple bottom line sustainability (Elkington, 1997) not found in the current literature thereby adding to the growing body of knowledge on organizational sustainability. Secondly, the goal was to provide academic researchers and business organizations across industry sectors with an instrument that would enable measurement of strategic organizational climate for sustainability in its broadest conceptualization to date the triple bottom line to find areas of strengths and weaknesses and thereby "calculate" a path for improvements as deemed appropriate. After a norming process, to be done in the future, SOS climates of businesses can then be compared and ranked by independent entities and used in improving brand image, and attracting sustainability-minded talent as well as investors. Since organizations of any kind have, or should have, a stake in TBL sustainability, the same instrument, as developed, can be immediately applied, with comparisons and rankings done later and subject to relevant norming procedures, for those kinds of organizations.

A pivotal development as a result of the pilot study phase was the need to re-conceptualize the instrument. As it turned out, the economic sustainability climate variables were treated in a particular way no matter what dimension was involved. The same applied to environmental sustainability and social sustainability items. In principle, this amounted to a recognition that it would be advantageous to measure the climate of each aspect of the TBL separately, and then combine the three scores into an overall SOS climate scale score.

In its current form, the instrument has 7 items measuring climate for economic sustainability, 7 items measuring climate for social sustainability, and 11 items measuring climate for environmental sustainability. Since each variable takes on a whole number value from 1 to 5, inclusive, raw total scores of the instrument for TBL components will be values between 7 and 35 (inclusive) for economic and social, and between 11 and 55, inclusive, for environmental. These factors can be thought of as ordered in their nature, where the climate of economic sustainability, for example, can be better in one business organization relative to another, but it is not measurable with same accuracy as the laser gun speed measurement of a car moving along an interstate highway. Fuzzy set theory tools (Smithson & Verkuilen, 2006) are appropriate for use in this context. Zadeh (1965) proposed this theory as an extension to traditional set theory from membership in a set being binary in nature; either an element is a member of a set, call it membership with level 1, or

an element is not a member of a set, call it membership with level 0. According to this extension, membership in a set can provide important insights if we allow levels of membership in a set to take on decimal values between 0 and 1. This approach may be highly useful with scales of this kind, especially when multiple factors need to be combined into a single instrument score with an associated easily understood interpretation of its meaning, perspective, advantages and disadvantages. Based on this approach, we can, for example, score the level of "goodness" of the climate for economic sustainability as a number between 0 and 1, with 1 being the ultimate level and 0 being the lowest possible level imaginable. Creating a membership function to convert raw instrument subscale total scores, between 7 and 35 or between 11 and 55 in this instrument, into a single output value between 0 and 1 (inclusive) can be done in a number of ways. One way is a linear function that relies on the determination of two thresholds: one under which the level of membership will be 0, and one above which the level of membership will be 1, with all other output values are determined by a straight line function connecting the two threshold points determined earlier. The disadvantage of this approach is that it considers the impact of a one-unit increase of the input raw score to be the same for any values between the threshold points.

Another approach is to use a logistic membership function (Smithson & Verkuilen, 2006, p. 22) of the form:

$$m_{ECON}(x) = 1/[1 + e^{-a(x-b)}]$$

Where: m represents the membership function, the ECON subscript identifies the set as the set of "good" economic sustainability climate, x is the input raw score of the scale for the total score of 7 relevant items, and a and b are parameters of slope and center, respectively.

In the case of economic and social sustainability climate, it turned out that using $a = 0.25, b = 21$ would be advantageous, noting that:

$m_{ECON}(21) = m_{SOCIAL}(21) = \frac{1}{2}$ which would coincide with corresponding membership levels at $x = 21$ when using the linear membership function approach.

In the case of environmental sustainability climate, using $a = 0.16, b = 33$ would be advantageous, noting that:

$m_{ENVIRON}(33) = \frac{1}{2}$ which would, again, coincide with corresponding membership level at $x = 33$ when using the linear membership function approach.

In choosing between a *linear* versus a *logistic* membership function approach, it can be observed that the logistic approach has the clear advantage of treating the levels of memberships in the sets of "good" economic sustainability climate, "good" social sustainability climate, and "good" environmental sustainability climate as levels that are, in reality, positive decimals (strictly greater than 0) and less than 1, representing some level of sustainability climate that always has room

for improvement. Parameter values for a were selected to create similar characteristics across extreme values of the three subscale membership values $m_{ECON}(7) = m_{SOCIAL}(7) = 0.0293$, $m_{ENVIRON}(11) = 0.0287$, and

$$m_{ECON}(35) = m_{SOCIAL}(35) = 0.9707, m_{ENVIRON}(55) = 0.9713$$

At this point we have a membership level in each factor of the TBL SOS climate using a logistic membership function, and the challenge is to combine the three membership levels into one TBL SOS climate score.

Fuzzy set theory enables us to consider a few viable options, each with advantages and disadvantages that can be clearly understood in terms of this construct. SOS climate refers to our interest in organizational climate for sustainability in all three fuzzy sets. This corresponds to traditional set theory operation of intersection of three sets. We want the climate to be simultaneously "good" for economic sustainability, and "good" for social sustainability, and "good for environmental sustainability. In addition, we have the notion of traditional set theory that in the absence of one of the factors (membership level 0 for one of the factors in terms of fuzzy set theory), we cannot say that we have a TBL SOS climate, implying a desired TBL SOS climate membership score of 0.

On the other hand, if all three factors in traditional set theory are judged to be "good" (membership levels of 1 for each fuzzy set), then we have a "good" TBL SOS climate, implying TBL SOS climate membership of 1.

The fuzzy set theory definition for membership levels assignments for the fuzzy set intersection operation is

$m_{ECON \cap SOCIAL} = \min (m_{ECON}, m_{SOCIAL})$ (Smithson & Verkuilen, 2006, p. 9)

Noting that this definition agrees with traditional set theory in the extreme cases, the implication for the TBL instrument is that we can calculate the membership level score for the intersection of the three fuzzy sets as

$$m_{ECON \cap SOCIAL \cap ENVIRON} = \min (m_{ECON}, m_{SOCIAL}, m_{ENVIRON})$$

As a result, one way to assess level of membership in TBL SOS climate is to use the minimum score. A clear disadvantage of such an approach is that the minimum completely ignores scores in two of the three components; for example, membership levels of $(0.2, 0.95, 0.95)$ will result in same overall climate score as $(0.2, 0.2, 0.2)$.

Clearly the first business needs to improve only one aspect of TBL while the second has a long way to go in all three. We will not know that if we use the minimum.

A second approach (Smithson & Verkuilen, 2006, p. 70) replaces the minimum with a multiplication operator, which will still coincide with traditional set theory in the extreme cases of 0 and 1 membership levels, just as the minimum did, but will produce distinctive SOS climate outcomes for the numerical examples above.

The disadvantage of the product operator is that it would tend to produce low TBL SOS climate scores and the product implicitly treats the factors as independent, when that is not the case in reality.

A third approach, which is the most appealing for this study, is to use a fuzzy set operation that has no counterpart in traditional set theory. There are a number of ways that this operation, called fuzzy aggregation, can be defined (Smithson & Verkuilen, 2006, p. 14), one of which is based on the geometric mean:

$$m_{ECON\ \Gamma\ SOCIAL\ \Gamma\ \mathrm{ENVIRON}} = \sqrt[3]{m_{ECON} m_{SOCIAL} m_{ENVIRON}}$$

The Γ, Gamma symbol denotes the fuzzy aggregation operation of fuzzy sets.

An initial approach to aggregate three values into one may suggest the arithmetic mean as a candidate. The geometric mean possesses, however, a desired property that would not be matched by the arithmetic mean. That property guarantees that a

certain percentage increase in any of the three components will have the same impact on the aggregate score. For example, membership levels (0.2, 0.25. 0.3) changing to (0.24, 0.25, 0.3) or changing to (0.2, 0.3, 0.3) or changing to (0.2, 0.25, 0.36) produce a change in arithmetic means from 0.25 to 0.263333…, 0.266666…, and 0.27 respectively, while the geometric mean changes from 0.246621207 to 0.262074136, 0.262074136, 0.262074136 respectively. This example reflects an exact 20% increase in exactly one of the SOS climate membership factors. As can be seen from the numerical calculations, an identical percentage change is leading to different arithmetic means and identical geometric means.

The Human Development Index (HDI) is an example of a UN index that has changed its aggregation method in 2010 to the geometric mean of a three-component fuzzy set model. HDI combines economic, health, and education into an aggregated score that produces a number between 0 and 1 for a certain development level in a particular country (Smithson & Verkuilen, 2006). An argument can be made that an aggregated TBL Strategic Organization Sustainability climate score using a choice consistent with the choice made for HDI index makes a lot of sense. In order to make the analogy between TBL SOS climate and HDI, all we have to do is consider the organization to be a country. The factors have similarities, and the method of aggregation can be identical.

As a result of all of the above, the three options of combining economic sustainability climate, social sustainability climate, and environmental sustainability climate scores may deserve mention and may lead to particular interpretations that are clear, easy to understand, and useful, just as mean, median and mode may be useful measures of central tendency in a statistical distribution. Yet, the fuzzy set aggregation operation, in the sense of the geometric mean, may be the preferred number for organizations to use at this time. Furthermore, it may be worthwhile to note that this instrument, exhibiting good internal consistency reliability as well as good construct validity through CFA results, can be used in its present form by any business organization to gauge current TBL SOS climate, find factors that may need improvement, and consider corrective actions to embark on a path to achieve better TBL SOS climate scores in future instrument applications. This kind of internal exercise may have its own intrinsic value, giving business organizations measurements of the path they follow. It may also be the case that a better TBL SOS climate may later be found to be associated with better performance in other measurable areas important to the business, such as higher levels of job satisfaction or lower turnover rates. However, without good reference points for comparison, this is purely speculative and cannot be argued unless further studies are performed.

Explicitly, while this instrument in its current form can be used by organizations internally even before norms are developed, what business organizations cannot do at this time is compare themselves to their competitors. In order to gain the ability to compare TBL SOS climates at different organizations, care should be taken, and more research work needs to be performed to divide the population of organizations into sectors (private, public, nonprofit) that would be normed. Once normed, using a careful representative sampling plan to gain knowledge about the nature and characteristics of relevant distributions of membership function values for sampled organizations in each sector, standardized scores can be used to compare different organizations in each sector and rank SOS Climates within each sector.

Limitations

While the current study provided favorable evidence regarding the scale's reliability and validity, some limitations need to be noted.

Firstly, samples used to develop and validate the scale were comprised of employees working in organizations in the US recruited via Amazon MTurk online platform. While MTurk workers are widely used for survey research (Litman & Robinson, 2020), collecting samples from specific organizations inside and outside the United States will greatly enhance generalizability of findings.

Additionally, climate scale data is commonly aggregated to the organizational level. This was not possible in the current study. Larger organizational samples from specific organizations would allow for data aggregation (to workgroups, units, or departments) and comparisons between levels (C-suite, mid-level management, lower-level management, rank and file employees). By aggregating data in this manner, the SOS Climate scale would illuminate the level of alignment or lack thereof with respect to perceptions of organizational policies, practices and procedures across the levels.

Lastly, this research took place during dramatic societal changes and a major downturn in global economic conditions due to the COVID-19 pandemic. Therefore, the results of this study should be viewed in light of this black swan historic event and its far and wide-reaching impacts.

This may temporarily limit the applicability of the scale as the majority of businesses across the sectors struggle with COVID-19 related business impacts. As the COVID-19 situation unfolds, the hope is that the economic, political, and social situation stabilizes and that the recovery will bring renewed focus and commitment for integrating TBL sustainability into business operations and the need for measurement of SOS Climate.

Recommendations and Future Research

Research on strategic organization sustainability climate is still in its infancy. This study took a first step in conceptualizing and operationalizing strategic organizational sustainability climate using the TBL sustainability model. Future research in this area should address each of the study limitations discussed in the previous section.

Accumulation of validity evidence is seen as an ongoing process (Messick, 1989; Spector, 1992) and, as such, more research is recommended in order to explore the relationship between TBL SOS Climate scale and established measures of similar constructs (e.g., CSR climate, Ethical climate), as well as dissimilar constructs (e.g., strategic agility). Additionally, linking climate scores to objective measures of accounting and stock market performance, as well as employee turnover and environmental metrics (e.g., resource use), together with soft or subjective measures (e.g., organizational commitment, employee engagement, and turnover intentions) would further substantiate the theoretical and practical usefulness of the TBL SOS Climate measure.

With regards to scale norms, the scale should be administered to representative samples of companies across private, public, and nonprofit sectors in order to establish meaningful scale norms for each sector. Reporting mean and standard deviation for each sector will allow for standardized rankings of

organizations within sectors. Such rankings will be used to compare companies with regards to their TBL SOS Climates. Collecting large organizational samples will allow for multi-level analyses and meaningful aggregation, as well as the use of more powerful statistical techniques such as structural equation modeling (SEM) for examining causal relationships among variables. Lastly, longitudinal studies with one or more firms over time should be conducted in order to measure and track changes in TBL SOS climate and its improvements, as well as its impact on organizational performance.

Finally, this study anticipates that once TBL SOS Climate is accepted by the business community as a valuable tool for advancing business viability, the application of the scale will call for sustainability officers to manage such projects, thereby redefining their roles as TBL sustainability officers as opposed to the narrower roles of environmental sustainability officers they fulfill at the present time. An argument can be made that such a transition will be beneficial.

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Appendix A
Informed Consent

Study Title: Strategic Organizational Sustainability Climate: Scale Development and Validation
Principal Investigator: Petra Brnova
The study involves employee interviews (no more than one hour each). The interview will ask questions related to practice of triple bottom line sustainability in organizations. The PI would like you to complete the whole interview, but you may skip any questions you prefer not to answer. The interview will be audio-recorded for accuracy of data. Audio recordings are for transcription and analysis only and will not be released in any publication or report; they will be destroyed once the analysis is complete. Only the investigator will have access to your individual responses. All the information received from you, including your name and any other identifying information will be strictly confidential and will be kept under lock and key. You will not be identified nor will any information that would make it possible for anyone to identify you be used in any presentation or written reports about this study. Only summarized data will be presented at meetings or in any publications. You will remain anonymous for the purposes of the study.
Your participation in this study is completely voluntary. You are free not to participate or to discontinue participation at any point without any loss of benefits or penalty to you. If you understand and agree to participate, please sign below.
For more information about this research, contact Petra Brnova at pbrnova@my.fit.edu.
You can also contact the Florida Institute of Technology Institutional Review Board at 150 W. University Blvd., Melbourne, FL 32901, Telephone 321-674-8960

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Participant's Signature	Date
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Principal Investigator's Signature	Date

Appendix B
Interview Protocol

Hi, my name is Petra and I am a doctoral student at Florida Institute of Technology working on my dissertation. I am working on a project to develop an instrument that will assess the level of strategic organizational sustainability environment. The instrument will provide an indication of perceived sustainability achievement, benchmarking data and targeted information about areas that need enhancement to facilitate long-term organizational sustainability and reduce the likelihood of negative impacts of sustainability issues on business operations. Today I would like to ask you a few questions about your sustainability related work experiences here at [organization].

Any information you provide will be strictly confidential. Nothing you say will be directly shared with [the organization]. I will only use this information to ensure the instrument addresses all the critical factors. Thank you in advance for your participation.

Would it be alright if I recorded our conversation? This is best, so I can actually engage in the conversation.

I'll be taking notes on what you tell me, but again, this information will never be shared with anyone at [organization].

Just to give you an idea of the process, I will first ask you a few general background questions followed by more specific questions about your sustainability work. Before we get started, do you have any questions for me?

OK. Let's start.

Job function: What is your job title/job function? What do you actually do?

Tenure: How long have you been with the organization? In this position?

Circle Gender: M or F

Age brackets: 20-30, 30-40, 40-50, 50-60, 60-70

Tell me about a recent experience you had with sustainability related program at your organization. Describe the program. What went well? What, if anything, did NOT go so well?

Follow up questions:

What did you do? OR What did organization do?

How did this fit into the context of your work?

What was the outcome/consequence?

Why did it go well/not well?

What would you make sure was done differently if a similar situation were to arise?

How did people within [organization] react?

How did people outside of [organization} react?

Tell me about a time when a coworker (or supervisor) demonstrated effective sustainability related action in the workplace?

What did this person do? Why was it effective?

What specific organizational processes are important for sustainability to permeate workplace? In other words, if you were in charge of a company, what kinds of processes would you make sure were in place?

What operating values would be needed?

What would you make sure to avoid?

What can your organization do to support you in your sustainable work actions?

What areas do employees at this organization need to improve/do better to be more effective in terms of sustainability?

What does your work group or division need to do better to support sustainability in your organization?

What do other divisions need to do better to support sustainability in your organization?

[Ask if only ecological sustainability is mentioned] Concept of sustainability has variety of meanings and connotations. In my research, I define sustainability in terms of so-called triple bottom line or balancing of economic, social, and environmental performance. (when I talk to people about sustainability, they typically focus on environmental side only, I am trying to broaden the scope of this term to encompass all 3 aspects).

With this definition of sustainability in mind, did you have experience with any social initiatives aimed at local community (volunteering, philanthropy/charitable giving), and/or employees (health, wellness) at your organization?

What about economic aspects!? Do you know how organization manages its finances? Is there an ethics code the organization follows? Do you know about corporate governance at your organization?

[Ask about any of 10 dimensions not mentioned]

How does top management support show support for sustainability?

What is your sustainability strategy?

How and how often is sustainability info communicated internally and externally?

What are resources allocated to sustainability initiatives? How is sustainability financed?

How is sustainability integrated into HR practices - recruitment, job descriptions, orientations, training & development, rewards, recognition etc.

What is the status of partnership and collaboration with external NGOs and groups?

This wraps up all the questions I have for you. Do you have anything else that you want to share that you think could be relevant?

Thank you so much for your time. If you are interested, I can provide you with a short summary of the study's results when they are ready.

Appendix C
Letter to Participants

Request for participation in the research study.

Request for conducting interviews.

[Request for online survey completion.]

(Name of Organizational Leader)

I am a doctoral student at Florida Institute of Technology. My dissertation research involves developing and validating strategic organizational sustainability climate assessment as a tool for helping companies embed sustainability into their corporate DNA, much like you do it in your company. The interview sample population for this study consists of managers or personnel in charge of sustainability at organizations committed to sustainability.

[Personnel at the organizations committed to sustainability (for the survey validation part)].

[The study will utilize an online survey which should take approximately 30-40 minutes to complete]

The study will utilize semi-structured interviews lasting approximately one hour, data from which will be later utilized for survey development. The interviews will be recorded with the permission from the participants. Interview data will be kept confidential. All data will be reported only as an aggregate. I am requesting about 65 minutes of time where I can talk with some of your staff members about

sustainability practices at your organization. Upon completion of the study, I can provide your company with the summary of results and recommendations.

[Would it be possible for me to visit your company to explain my study and ask if the employees would volunteer to complete the online survey?]

This study has been approved by the institutional review board at Florida Institute of Technology. If you have any questions about the study, do not hesitate to contact me at 321-917-5839 or pbrnova@my.fit.edu. You may also reach out to my major advisor, Dr. Lars Hansen at lhansen@fit.edu.

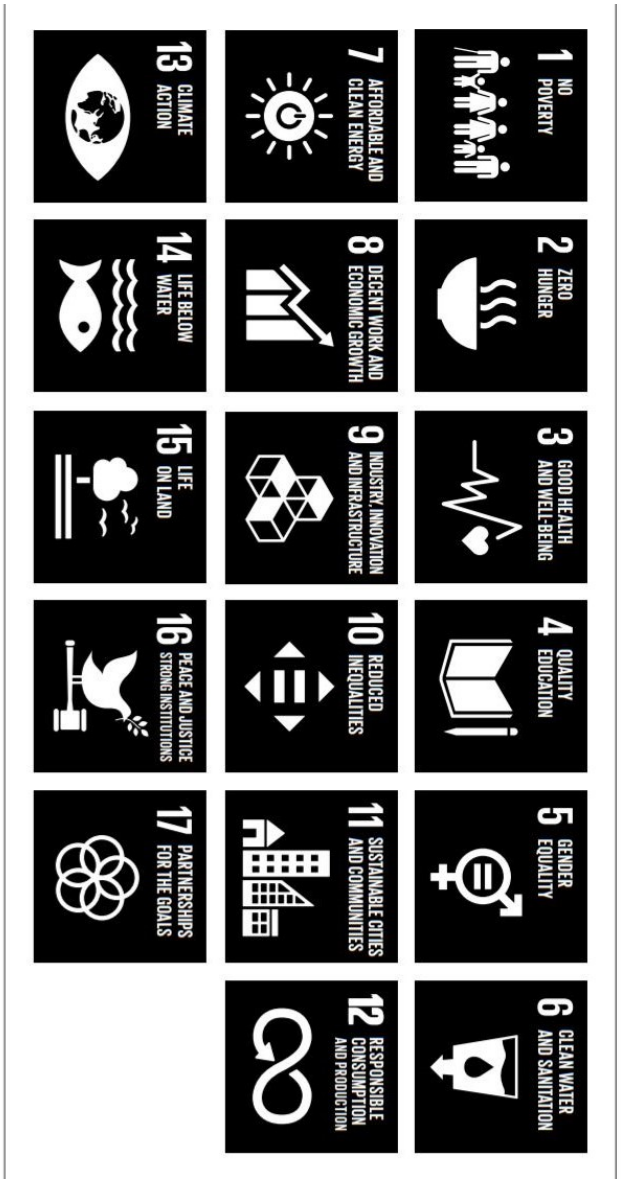
Thanks for your time and consideration. I hope the start the year is going smoothly for you and your team,

(Signature)

Appendix D
Existing Sustainability Climate Measures

Authors	Measure	Number of Dimensions/Factors	Sustainability Climate Definition
Hall (2005)	Sustainability Climate Survey 21-items	Five: Perceived top-management support (4 items), Sustainability norms (5), Rewards (4), Employee involvement (4), and Shared vision (4)	Separate definitions - A union of the three dimensions of economy, society, and natural environment - Perceptions of particular organizational practices that are diffused through relational networks
Arnaud, Tinoco, & Rhoades (2013)	Climate of Sustainability Survey 17-items	Three: Sensitivity to sustainability (6), Motivation for sustainability (6), and Responsibility for sustainability (5)	Separate definitions - Employees' perceptions of "how things are done around here". Includes characteristics, which the members of the organisation perceive and come to describe in a shared way.
Norton, Parker, Zacher, & Ashkanasy (2014)	Green Work Climate Perceptions Survey 8-items	Two: Climate perceptions of the organization (4), and Climate perceptions of coworkers (4)	Employee perceptions of policies, procedures and practices relating to environmental sustainability as demonstrated by organization and their coworkers.

Appendix E
United Nations Sustainable Development Goals



Appendix F
TBL SOS Climate Scale

This appendix contains the final TBL SOS Climate Scale. All items were rated on a 5-point Likert scale ranging from Strongly Disagree (1) to Strongly Agree (5). The item stem used for all items was "My organization shows commitment to sustainability by..."

Economic Sustainability Climate Dimension

Reducing Risk Sub-dimension
1. Meeting the company's economic responsibilities
2. Guarding against all forms of corruption, including bribery and extortion
3. Taking steps to minimize financial risks
4. Guarding against financial conflicts of interest on the part of its employees

Focusing on Long-Term Success Sub-dimension
5. Taking a long-term view of profitability
6. Having a solid plan for achieving economic sustainability goals
7. Being concerned with becoming more financially sustainable

Social Sustainability Climate Dimension

Donating Resources Sub-dimension
1. Participating in fundraisers and charity events
2. Supporting social causes and initiatives in the community
3. Routinely sponsoring charitable events
4. Donating money to charities and causes the company cares about

Promoting Community Service Sub-dimension
5. Encouraging employees to create new social initiatives that improve the lives of employees, customers, or the community
6. Providing employees with opportunities for community service
7. Recognizing employees who donate their time and talent to serve the community

Environmental Sustainability Climate Dimension

Finding Alternatives Sub-dimension
1. Continuously improving environmental sustainability in each department
2. Making a conscious effort to use renewable resources
3. Requiring each manager to help improve environmental sustainability in his or her department
4. Building internal workforce capabilities to effectively manage environmental sustainability risks and opportunities
5. Changing operational practices to become more environmentally sustainable
6. Recognizing individuals and teams who develop innovative ideas to improve the company's environmental performance

Minimizing Negative Impacts Sub-dimension
7. Taking steps to minimize environmental risks
8. Minimizing the company’s environmental footprint
9. Proactively managing environmental impacts
10. Not prioritizing increased profits at the expense of environmental damage
11. Carefully considering how the company’s products and services impact the planet

Appendix G
Summary of Literature

Table 1 – Summary of Literature

General Area/ Field	Authors	Framework	Operational Definition/ Sources of CA/Measurement of Performance	Related Concepts
Sustainability				
	UN WCED (1987) Neumayer (2003)	Sustainable development (SD)	Global Reporting Initiative (GRI) Standards, 17 UN (Global) Sustainable Development Goals (SDGs)	Intergenerational equity, Sustainable economic growth, Responsible resource use, Stewardship, Responsibility to future generations, Weak sustainability

	Elkington (1994; 1998)	Triple bottom line (TBL) People, planet, profit (3Ps)	Integrating social, and environmental impacts (soft metrics) with economic performance (hard metrics)	CSR, Corporate Citizenship, CSV, ESG, Sustainability Metrics, Business Metrics, KPIs, Sustainability reporting, GRI, AASH, ISO 14000, EMS
	Goodland (1995), Goodland & Daly (1996)	Environmental sustainability (ES) as maintenance of life supporting systems	Environmental health indicators, the Ecological footprint framework, the Natural Step	Natural capital, Natural resources, Finite ecosystem, Environmental impacts, Externalities, Weak sustainability, Strong sustainability
	Schneider (2015)	Economic sustainability – maintenance of capital - often privileged over environmental and social sustainability	Capital, Accounting measures of profitability such as return on investment (ROI), return on asset (ROA), return on equity (ROE). Market-based measures such as share price or	Corporate/ Business sustainability

			earnings per share. Growth measures such as changes in size over time	
	Bansal (2005) Bansal & DesJardine (2014)	Business sustainability as managing intertemporal trade-offs while simultaneously pursuing TBL		Intertemporal trade-offs, Corporate sustainable development, Organizational resilience
Strategic Management				
	Barney (1991) Wernerfelt (1984) Penrose (1959)	Resource-based view (RBV)	VRIN characteristics	Sustainable competitive advantage (SCA), Sustainable (economic) growth
	Hart (1995), Hart & Dowell (2011)	Natural-resource based view (NRBV)	pollution prevention (lower costs), product stewardship (preempt competitors), and sustainable development (future position)	Circular economy

	Barney (1986)	RBV	Organizational culture	SCA
	Freeman (1984; 1994)	Stakeholder theory, stakeholders		Shareholder theory, economic value, strategic CSR, instrumental CSR, CSV, reputation management, public relations
	Porter & Kramer (2011)	Creating shared value (CSV)	Re-conceiving products and markets, redefining productivity in the value chain, and enabling local cluster development	Strategic CSR, social innovation, instrumental stakeholder theory, conscious capitalism, corporate responsibility
	Crane et al. (2014)	CSV criticism		
Business Ethics				
	Carroll (1979; 1992; 1999)	CSR	Four-dimensional model of CSR - economic, legal, ethical, discretionary (philanthropic) responsibilities	Corporate responsibility, Corporate ethical responsibilities, Corporate social performance (CSP; Carroll, 1979), Corporate citizenship (CS), Organizational

				reputation, ESG issues
	Aguinis & Glavas (2012)	CSR review		
	(Orlitzky, Schmidt, & Rynes, 2003)	CSR – CFP (corporate financial performance)		
	Margolis & Walsh (2001)	CSP – CFP Corporate Financial Performance		
Organizational Behavior				
	Schein (2010) Martin (1992)	Organizational culture		Corporate culture
	Glick (1985) Schneider et al. (2011) Kuenzi & Schminke (2009)	Organizational climate		Corporate context, organizational environment
	Zohar (1980; 2000; 2011; 2014)	Safety climate		
	Norton et al. (2014)	Environmental sustainability climate		
	Arnaud et al. (2013); Hall (2005)	Sustainability climate	Climate inconsistently defined Sustainability inconsistently applied	

Appendix H
Interview Demographics

Job Title	Tenure (in years)	Gender	Age	Industry
VP of Business Development	10	Female	50-60	Financial Services
Sustainability Officer	1	Male	20-30	Education
Sustainability Programs Manager	1.5	Female	30-40	Nonprofit
Founder CEO	4	Male	20-30	Manufacturing
Environmental Programs Coordinator	2	Male	30-40	Government
Executive Director	6	Female	50-60	Nonprofit
VP of Marketing Operations	7	Female	30-40	Consumer Goods
Executive Director	14	Male	50-60	Nonprofit
EHS Manager	7	Male	30-40	Technology (*written interview)
EHS Global Senior Director	3	Female	40-50	Aerospace

Appendix I
Pilot Study Demographics

	Frequency	Percent
Gender		
Male	93	38.4
Female	146	60.3
Non-binary	3	1.2
Age		
18-25 years	32	13.2
26-35 years	96	39.7
36-45 years	44	18.2
46-55 years	35	14.5
56+	35	14.5
Industry		
Retail	26	10.8
Manufacturing	37	15.4
Finance	38	15.8
Professional Services	42	17.5
Healthcare	29	12.1
Government	11	4.6
Non-profit	20	7.5
Other	39	16.3
Total	242	100

Appendix J
Main Study Demographics

	Frequency	Percentage
Gender		
Male	91	49.2
Female	94	50.8
Non-binary	0	0
Age		
18-25 years	15	8.1
26-35 years	75	40.5
36-45 years	44	23.8
46-55 years	29	15.7
56+	22	11.9
Industry		
Retail	16	8.6
Manufacturing	38	20.5
Healthcare	32	17.3
Government	20	10.8
Non-profit	3	1.6
Other	76	41.1
Tenure		
Less than 1 year	6	3.2
1-3 years	55	29.7
4-6 years	51	27.6
7-10 years	30	16.2
11-15 years	15	8.1
16+	28	15.1
Total	185	100

Appendix K
Pattern Matrix for PCA with Item Wording

	Pattern Matrix[a]			Item Wording
	Component			
	1	2	3	
Q6_28	0.863			requiring each manager to help improve environmental sustainability in his or her department
Q6_30	0.861			minimizing the company's environmental footprint
Q7_21	0.826			making a conscious effort to use renewable resources
Q6_25	0.814			taking steps to minimize environmental risks
Q6_27	0.806			continuously improving environmental sustainability in each department
Q9_12	0.798			building internal workforce capabilities to effectively manage environmental sustainability risks and opportunities
Q6_26	0.790			proactively managing environmental impacts
Q7_20	0.736			carefully considering how the company's products and services impact the planet
Q6_32	0.735			changing operational practices to become more environmentally sustainable
Q11_11	0.708			recognizing individuals and teams who develop innovative ideas to improve the company's environmental performance
Q6_7	0.573			not prioritizing increased profits at the expense of environmental damage
Q6_2		0.792		taking steps to minimize financial risks
Q6_9		0.737		being concerned with becoming more financially sustainable
Q6_10		0.734		meeting the company's economic responsibilities
Q7_3		0.606		having a solid plan for achieving economic sustainability goals
Q6_5		0.600		taking a long-term view of profitability
Q6_6		0.571		guarding against all forms of corruption, including bribery and extortion
Q6_4		0.451		guarding against financial conflicts of interest on the part of its employees
Q10_7			-0.827	donating money to charities and causes the company cares about
Q12_7			-0.729	routinely sponsoring charitable events
Q10_6			-0.725	recognizing employees who donate their time and talent to serve the community
Q12_8			-0.710	providing employees with opportunities for community service
Q6_18			-0.688	participating in fundraisers and charity events
Q12_5			-0.568	supporting social causes and initiatives in the community
Q11_7			-0.502	encouraging employees to create new social initiatives that improve the lives of employees, customers, or the community

Extraction Method: Principal Component

Appendix L
Pattern, Structure, and Component Matrix

Pattern Matrix[a]			
	Component		
	1	2	3
Q6_28	**0.863**	0.039	0.037
Q6_30	**0.861**	0.098	0.070
Q7_21	**0.826**	0.034	0.009
Q6_25	**0.814**	0.079	0.067
Q6_27	**0.806**	0.070	-0.010
Q9_12	**0.798**	-0.018	-0.030
Q6_26	**0.790**	0.052	-0.028
Q7_20	**0.736**	0.088	-0.073
Q6_32	**0.735**	0.049	-0.116
Q11_11	**0.708**	-0.026	-0.161
Q6_7	**0.573**	-0.132	-0.271
Q6_2	-0.047	**0.792**	-0.016
Q6_9	-0.108	**0.737**	-0.084
Q6_10	0.051	**0.734**	-0.003
Q7_3	0.145	**0.606**	-0.019
Q6_5	0.247	**0.600**	0.046
Q6_6	0.053	**0.571**	-0.029
Q6_4	0.138	**0.451**	-0.223
Q10_7	-0.195	0.176	**-0.827**
Q12_7	0.181	-0.075	**-0.729**
Q10_6	0.000	0.112	**-0.725**
Q12_8	0.212	-0.046	**-0.710**
Q6_18	0.013	0.051	**-0.688**
Q12_5	0.233	0.080	**-0.568**
Q11_7	0.264	0.075	**-0.502**

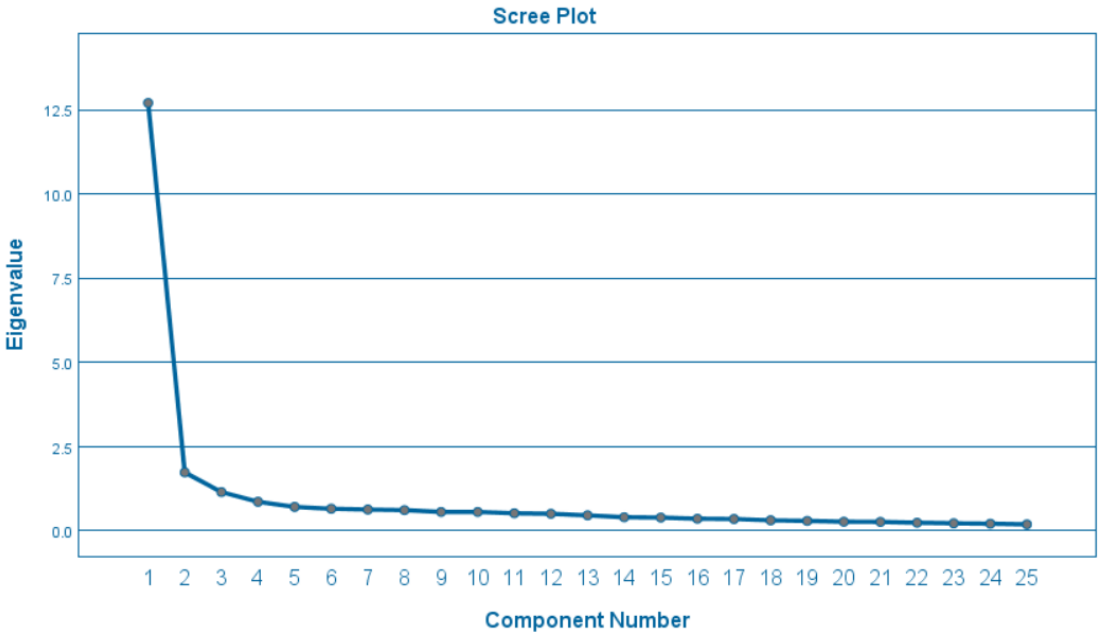
Structure Matrix			
	Component		
	1	2	3
Q6_30	**0.870**	0.535	-0.549
Q6_28	**0.860**	0.496	-0.548
Q6_27	**0.852**	0.524	-0.577
Q6_32	**0.838**	0.525	-0.624
Q7_21	**0.838**	0.486	-0.549
Q6_26	**0.837**	0.507	-0.574
Q7_20	**0.832**	0.539	-0.604
Q6_25	**0.815**	0.493	-0.511
Q9_12	**0.808**	0.443	-0.540
Q11_11	**0.799**	0.461	-0.607
Q6_7	**0.676**	0.344	-0.567
Q6_2	0.403	**0.776**	-0.449
Q6_10	0.460	**0.764**	-0.465
Q6_9	0.356	**0.726**	-0.445
Q6_5	0.549	**0.710**	-0.465
Q7_3	0.494	**0.697**	-0.468
Q6_4	0.533	**0.657**	-0.576
Q6_6	0.389	**0.617**	-0.397
Q12_8	0.649	0.487	**-0.821**
Q12_7	0.615	0.453	**-0.804**
Q10_7	0.442	0.551	**-0.803**
Q10_6	0.535	0.536	**-0.790**
Q12_5	0.647	0.541	**-0.766**
Q6_18	0.490	0.461	**-0.727**
Q11_7	0.633	0.515	**-0.718**

Extraction Method: Principal Component Analysis.
Rotation Method: Oblimin with Kaiser Normalization.

Component Matrix[a]			
	Component		
	1	2	3
Q6_32	0.820	-0.202	0.032
Q6_30	0.818	-0.265	0.153
Q7_20	0.814	-0.193	0.067
Q6_27	0.813	-0.241	0.098
Q6_28	0.803	-0.289	0.115
Q6_26	0.800	-0.241	0.081
Q7_21	0.787	-0.273	0.096
Q11_11	0.775	-0.222	-0.020
Q6_25	0.764	-0.258	0.140
Q12_8	0.759	0.072	-0.343
Q9_12	0.756	-0.281	0.055
Q12_5	0.754	0.098	-0.225
Q12_7	0.725	0.072	-0.365
Q11_7	0.724	0.069	-0.192
Q10_6	0.693	0.235	-0.311
Q6_7	0.661	-0.206	-0.126
Q6_4	0.657	0.247	0.072
Q10_7	0.646	0.361	-0.356
Q6_5	0.646	0.224	0.269
Q6_18	0.629	0.188	-0.315
Q7_3	0.610	0.279	0.229
Q6_10	0.606	0.376	0.275
Q6_2	0.570	0.445	0.281
Q6_9	0.529	0.453	0.222
Q6_6	0.507	0.295	0.203

Communalities		
	Initial	Extraction
Q6_7	1.000	0.495
Q6_25	1.000	0.669
Q6_26	1.000	0.704
Q6_27	1.000	0.730
Q6_28	1.000	0.742
Q6_30	1.000	0.763
Q6_32	1.000	0.715
Q7_20	1.000	0.704
Q7_21	1.000	0.703
Q9_12	1.000	0.654
Q11_11	1.000	0.651
Q6_2	1.000	0.603
Q6_4	1.000	0.498
Q6_5	1.000	0.540
Q6_6	1.000	0.385
Q6_9	1.000	0.534
Q6_10	1.000	0.585
Q7_3	1.000	0.503
Q6_18	1.000	0.530
Q10_6	1.000	0.633
Q10_7	1.000	0.675
Q11_7	1.000	0.566
Q12_5	1.000	0.629
Q12_7	1.000	0.664
Q12_8	1.000	0.698

Appendix M
PCA Scree Plot



Appendix N
CFA Factor Loadings

Latent Factor	Indicator	B	SE	Z	p-value	Beta
environmental	x1	1.000	0.000	NA	NA	0.786
environmental	x2	0.977	0.090	10.887	0	0.734
environmental	x3	1.109	0.090	12.330	0	0.809
environmental	x4	1.088	0.096	11.361	0	0.759
environmental	x5	1.024	0.089	11.523	0	0.767
environmental	x6	1.051	0.091	11.556	0	0.769
environmental	x7	1.130	0.088	12.770	0	0.830
environmental	x8	0.868	0.094	9.233	0	0.640
environmental	x9	1.010	0.085	11.902	0	0.787
environmental	x10	1.128	0.083	13.619	0	0.871
environmental	x11	1.082	0.084	12.858	0	0.834
social	x12	1.000	0.000	NA	NA	0.753
social	x13	1.121	0.114	9.855	0	0.717
social	x14	1.243	0.108	11.503	0	0.824
social	x15	1.152	0.111	10.395	0	0.753
social	x16	1.245	0.108	11.573	0	0.828
social	x17	1.122	0.107	10.519	0	0.761
social	x18	1.004	0.107	9.372	0	0.686
economic	x19	1.000	0.000	NA	NA	0.649
economic	x20	0.968	0.122	7.935	0	0.680
economic	x21	0.714	0.127	5.613	0	0.458
economic	x22	1.032	0.133	7.776	0	0.664
economic	x23	1.212	0.138	8.790	0	0.774
economic	x24	1.304	0.151	8.652	0	0.758
economic	x25	1.293	0.148	8.713	0	0.765