Measuring Comprehensive Wellbeing In Vermont: An Applied Economics Perspective

MEASURING COMPREHENSIVE WELLBEING IN VERMONT: AN APPLIED ECONOMICS PERSPECTIVE

A Thesis Presented

by

Katherine N Gallagher

to

The Faculty of the Graduate College

of

The University of Vermont

In Partial Fulfillment of the Requirements
for the Degree of Master of Science
Specializing in Community Development and Applied Economics

January, 2020

Defense Date: September 25, 2019
Thesis Examination Committee:

Jane Kolodinsky, Ph.D., Advisor
Jon Erickson, Ph.D., Chairperson
Asim Zia, Ph.D
Michael Moser, M.S.
Cynthia J. Forehand, Ph.D., Dean of the Graduate College

Abstract

While human "wellbeing" has historically been measured by economic growth, traditional metrics do not fit the challenges of the 21st century. Increasingly, decision-makers are adopting new guiding frameworks that encompass a more holistic understanding of wellbeing and progress including concepts such as ecological health and subjective wellbeing. Yet, the development processes and implementation challenges faced by these initiatives - as well as the opportunities for advancement - remain relatively unexamined for state and regional communities. This research considers the implementation and potential of existing wellbeing indicator systems in Vermont. With limited research on wellbeing measurement at the state or local level, this thesis provides novel insight using the state of Vermont as a case study. A better understanding of specific measurement tools, public and political interest in data collection, and shared experiences can help to fill the current gap in the literature and provide useful information for decision-makers.

The first article contains a case study analysis of four wellbeing indices at the regional and state level in Vermont: the Vermont Genuine Progress Indicator (GPI), the Vermont Happiness Index, the Chittenden County Environment, Community, Opportunity and Sustainability (ECOS) project, and Vermont Act 186 (the "Outcomes Bill"). The case studies provide contextual background describing the impetus and development of each wellbeing initiative. The similarities, differences, and connections between each case study are further examined based on a general program theory of wellbeing measurement. The second article narrows in on one specific wellbeing index: the 2017 Vermont Happiness Index, a representative statewide survey of subjective wellbeing. The Index is composed of eleven domains of wellbeing, with each domain as an aggregation of 3 or more Likert-scale questions. The survey results are analyzed through statistical testing and recommendations for future research are provided.

Acknowledgements

My sincerest gratitude to my thesis committee, each a pioneer in their field. To Jane Kolodinsky – my advisor, department chair, teacher – who has provided endless support through the academic process and beyond, and who made this research possible in the first place. To Jon Erickson, whose passion and ability to communicate complex topics outside of the classroom inspired me to return to graduate school. To Asim Zia, whose teachings shaped the path of my academic and post-academic career. And to Michael Moser, who spent hours with me going deeper into the rabbit hole that is wellbeing research, and whose friendship and mentorship helped me to continue this work in the "real world."

This thesis was inspired and made possible by my friends and family who fueled late nights with hot meals and encouragement – I am a very privileged person to have such incredibly generous and caring people in my life. And to my whole CDAE community - from the basement to the top floor – there's so much to thank you for. I have appreciated every ounce of support and minute of rambling conversation with each of you!

Table of Contents

List of Tables

List of Figures

CHAPTER 1: INTRODUCTION

Gross Domestic Product (GDP) and similar macro-economic indicators have largely guided policy and politics in the United States since the end of World War Two. Yet while the U.S. boasts the highest GDP in the world (World Bank, 2017), it has been lagging in terms of education (DeSilver, 2017), health care (McNeil Jr., 2017), income inequality (Chappell, 2019) and other critical indicators of wellbeing. As the adage goes, "we are what we measure," and indeed, the dominance of GDP has resulted in the prioritization of economic growth for its own sake - often in neglect of the very aspects of life that now suffer (Bishop & Green, 2011; Costanza et al., 2014). The complexity of the world, including what constitutes the wellbeing of an individual or society, has been increasingly recognized by decision makers as a necessary consideration for effective public policy. Statistical indicators are used to dissect this complexity, determine the components of a healthy and happy community, and design and assess public policies. The importance of these indicators and what they measure goes beyond the value of knowledge; measurements can change human behavior and choices in ways that can increase - or decrease - wellbeing (Chancel, Thiry, & Demailly, 2014; Nations, 2013; Stiglitz, Sen, & Fitoussi, 2009).

However, gaps have been forming between the story told from widely used economic indicators and public perceptions of reality. When citizens hear on the news that GDP is growing while their community continues to suffer economically and otherwise, trust in government falters and divides deepen: The Organization for Economic Co-operation and Development's (OECD) *How's Life?* (*2017*) report found that trust in government fell in over half of all OECD countries compared with 2005. The societal prioritization of GDP creates tensions in another way, as political leaders are demanded to simultaneously grow GDP and support public initiatives such as education or pollution reduction that may decrease GDP. Often, public perception of ‘fishiness’ is justified due to the misuse or miscommunication of economic data (Stiglitz et al., 2009). In a poignant example, the Great Recession of 2008 blindsided economists, bankers, politicians, and others who depended on economic indicators, “laying bare some of the inherent flaws in the current systems” (Costanza, Hart, Posner, & Talberth, 2009, p. 33; Stiglitz et al., 2009). Ongoing environmental crises in the form of climate change, species extinction, biochemical flows and more are also attributed to market failures that have allowed constant pollution, resource extraction, and the burning of fossil fuels - the very mechanisms that allowed for the intense growth of the twentieth and twenty-first centuries (Cubasch et al., 2013; Hansen, 2003; Nordhaus & Tobin, 1972).

The recognition of the limitations of macroeconomic indicators - GDP in particular - and the potential of new indicators to adjust, complement, or replace them has been growing worldwide for a number of years in various arenas, including the United Nations, the OECD, and numerous national, regional, and local governments (European Commission, 2009; Nations, 2013; OECD, 2011; Stiglitz et al., 2009)(OECD, 2011). There has also been much trans-disciplinary academic literature discussing the limits of historical measures, most prominently in the social sciences, which have contributed much of the theoretical and practical grounding for new indicators. Psychology, as a more individual-focused discipline, has provided the basis for the use of “subjective” indicators (asking people directly about their state of wellbeing) and the so-called "happiness" movement by showing that such subjective, personal conditions are statistically measurable and valid (Diener, Suh, Lucas, & Smith, 1999; Kahneman & Krueger, 2006). More aggregated disciplines such as sociology have contributed to similar research streams on quality of life (QOL) and "social" indicators at a macro-level (K. Land, 1983). Economists, too, have questioned the neoclassical model of consumer utility, reviewing the foundation of macroeconomic metrics and making the conceptual arguments for why "wellbeing" matters (Easterlin, 1974; Layard, 2010; Nordhaus & Tobin, 1972; Sen, 1983). In addition, the growing field of Ecological Economics has found a comfortable home in its critique of orthodox economic models and in proposing more holistic approaches that incorporate environmental and ecological factors (Costanza et al., 2009; Daly & Cobb Jr, 1989; Max-Neef, 1995; Meadows, Meadows, Randers, & Behrens III, 1972). Yet, it is generally agreed among academics that there is not one perfect alternative indicator or index (van den Bergh & Antal, 2014); with any attempt to better account for the complexity of wellbeing, there are numerous questions of validity and fit for use. Further, where these new measurements have been put into place, their integration into public decision-making has been rare (Chancel et al., 2014; Nelson, Chandra, & Miller, 2018; Wallace & Schmuecker, 2013). This literature review provides the necessary context for the two articles in this thesis: "Wellbeing Indicators in Public Policy," and, "The Happiness Index as a Tool for Measuring Wellbeing in Vermont." First, I discuss the history of indicators (economic in particular) during the twenty-first century, and then review the international rise of wellbeing measurement.

Comprehensive Literature Review

Indicators for Policy: A Brief History

GDP has been the dominant indicator of societal wellbeing for the better part of the last century - yet for almost just as long, it has been recognized that GDP was not meant to play this role (Kuznets, 1934; Stiglitz et al., 2009). So why did GDP rise to the top, and how has it continued to be misused?

The beginning of the twenty-first century marked a period of radical social, economic, technological, and political change throughout the world. While periodic attempts to measure the output and income of a nation or region occurred throughout the previous few centuries, industrialization and urbanization facilitated the collection of and desire for more data. Additionally, as described by Karabell (2014), "…was the scientific imperative to rationalize that data. In Western European and in the United States during the industrial revolution, measurement was all the rage, in part from the belief that what could be measured could be tamed and shaped" (p. 60). These factors paved the way for the development of the field of statistics, and with it, government interest in measurement. Moving through the Great Depression of the 1930s, Western governments were particularly interested in better understanding the cause of the economic crisis, as well as assessing the impact of greater government spending through initiatives to deal with the crisis. Today, the former U.S. and the United Kingdom Treasury economists Simon Kuznets and Richard Stone are best known for defining national income accounts, which in part aimed to help their governments prevent such economic catastrophes by better managing their economies. These tools were backed by the emerging Keynesian theoretical framework (Giovannini & Tommaso, 2018). At the time, "the economy" was a new concept – thanks to the new indicators that explained what "the economy" was (Karabell, 2014). National income is "the total market value of production in a country's economy during a year," where "the broadest and most widely used measure of national income is gross domestic product (GDP)" (The Library of Economics and Liberty, n.d.). According to the Bureau of Economic Analysis, GDP "is the value of the goods and services produced in the United States" (U.S. Bureau of Economic Analysis, 2019). Much of the excitement surrounding the SNA and GDP came from their use by the U.S. during World War II, which allowed the country to transform into a war machine while simultaneously boosting internal consumption and revenues (Fioramonti, 2013)Giovannini & Tommaso, 2018). The aftermath of WWII soon after marked a new wave in the use of economic indicators. Western governments faced an even greater sense of urgency, not only due to the need to rebuild economically, politically, and physically, but also because the war was considered to be triggered by economic instability resulting from "unstable currency exchange rates and discriminatory trade practices that discourage international trade" (Costanza et al., 2009, p. 5; Karabell, 2014). As a result, at the 1944 Bretton Woods Conference in and led by the United States, the formal usage of GNP - and the internationally standardized System of National Accounts (SNA) on which the metric was based - was formally adopted by the global community and the soon-to-be powerful institutions of the World Bank and the International Monetary Fund (IMF). GNP and the SNA became important tools for the international institutions and the U.S. (through the Marshall Plan) to hold recovering and developing countries accountable through benchmarks of economic growth. The postwar wave was also "…marked by how to measure affluence," and how "…people throughout the world came to define themselves" (Karabell, 2014, p. 76). Globalization and expanding markets, advancements in technology and communications, and increasing democratic governance and citizens' education levels led to a greater public desire to measure and compare status (Karabell , 2014). The demand for indicators in the postwar order spread to businesses and the media in a way that did not exist before. As a simple to calculate metric of economic market activity, GNP (and later, GDP) soon became the ubiquitous method worldwide for evaluating and guiding policies, comparing national standards of living, preparing national budgets, formulating monetary policies, and serving as the "basis for production, investment and employment planning" (Costanza et al., 2009; Marcuss & Kane, 2007). Another factor in the growing desire for indicators can be attributed to the production competition between the U.S. and democratic nations, and the Soviet Union (Karabell, 2014). Other important and widely used indicators, such as unemployment, were also developed during this time. Similar to GNP/GDP, these specific macro-level metrics have their own pros and cons as an informative measure, yet continue to be used misleadingly by governments, the media, and industry as a simple indicator of societal wellbeing. We choose to focus on GDP here because of its place as 'the indicator of indicators.'

As GDP remains the most popular measure of national and state economies, it has been increasingly thought of as a measure of wellbeing and equated with individual prosperity - an inaccurate use with detrimental consequences. Kuznets (1934) expressed early on his concern that the simplicity of the GDP could make it prone to misuse:

> With quantitative measurements especially, the definiteness of the result suggests, often misleadingly, a precision and simplicity in the outlines of the object measured. Measurements of national income are subject to this type of illusion and resulting abuse, especially since they deal with matters that are the center of conflict of opposing social groups where the effectiveness of an argument is often contingent upon oversimplification. (p. 5-6)

Indeed, today GDP is often defined as a measure of social welfare or wellbeing (Stiglitz et al., 2009; van den Bergh & Antal, 2014). Further, researchers and policy-makers have increasingly recognized the impact of other factors beyond economic growth on the wellbeing of a society or individual. These limitations (described in greater detail below) have been acknowledged and addressed by international institutions such as the OECD, the World Bank, the United Nations, national governments from Bhutan to the U.K., as well as Nobel prize-winning economists including Simon Kuznets himself (1934), William Nordhaus and James Tobin (1972), Amartya Sen (1976), Daniel Kahneman (Kahneman, Krueger, Schkade, Schwarz, & Stone, 2004), and Joseph Stiglitz (2009).

van den Bergh (2009) categorizes GDP critiques found in the literature into seven main shortcomings:

1. *Principles of proper accounting.* Since GDP counts costs instead of benefits, it is unable to account for economic activities that present positive value for society, such as education. It also does not differentiate between ‘goods’ and ‘bads’, thus counting a negative (i.e., the cost of repairing infrastructure resulting from a hurricane) as a positive contribution to GDP. (Stiglitz et al., 2009, p. 92-93)
2. *Intertemporal considerations.* Van den Bergh explains that while there may exist a positive correlation between an increasing GDP and societal progress as individual incomes rise to meet basic needs, “the correlation between GDP and social welfare has to drop to zero at some point, or may already have done so.” (p. 2)
3. *Lexicographic preferences.* Material consumption should not be confused with the satisfaction of basic needs such as social connections or clean air - needs that GDP does not measure.(Diener et al., 1999; Easterlin, 1995; Sen, 1990)
4. *Empirical studies of happiness.* Beginning in the 1970s, researchers began documenting evidence that increasing income is correlated with increasing wellbeing but only up to a point, as shown by longitudinal trends of a growing GDP contrasted by stagnating or negative measure of social welfare (i.e., human happiness) (Easterlin, 1974; Max-Neef, 1995). Related subjective wellbeing literature has also argued that individual income is not an appropriate proxy for individual welfare as it does not

consider relative income and other income-independent factors that contribute to wellbeing (Diener & Suh, 1997); thus, aggregated economic growth at the national level (GDP) is unlikely an effective indicator of social wellbeing.

5. *Income distribution, relative income and rivalry for status.* As an aggregate measure that does not include relative income, GDP masks the distribution of economic growth and effects of inequality and tends to overestimate social welfare or progress" (Bagstad, Berik, & Brown Gaddis, 2014; van den Bergh, 2009 p. 119). Income distribution is also found to be less reflective of *wealth* than measures of consumption (Stiglitz et al., 2009).
6. *Formal versus informal economy.* GDP deals only with the formal market economy, and thus does not measure important non-market-based goods and services such as childcare or volunteering. By omitting the informal economy, GDP and employment figures can be "grossly underestimated" (ILO, 2013, p. 3) which in turn undervalue large segments of the population (i.e. women or subsistence farmers) and skew other GDP-based metrics. (Stiglitz et al., 2009; ILO, 2013)
7. *Environmental externalities and depletion of natural resources.* The final category relates to the inability of GDP to account for externalities, important examples of which include environmental pollution, resource extraction. Current market distortions have contributed to these and other

> environmental crises by excluding the positive value of many natural resources (i.e., biodiversity) from economic calculations, while those that are counted as assets are served by poor statistical practice that erroneously does not count resource depletion as a reduction in income. Additionally, the use of natural resources is not counted as a cost of production, resulting in classic public goods issues. (Stiglitz et al., 2009, p. 92-93; Costanza et al., 2014)

While many economists today acknowledge the limitations of GDP, some still deny that anything needs to be changed. Van den Bergh (2009) found that economists espouse two main reasons for this denial: first, they believe that the size of the impact of GDP on the actual progress of wellbeing is “modest,” and second, that GDP provides useful information despite its imperfection.

Researchers in the fields of economics, psychology, sociology and others responded to these limitations by expressing the need for better data through additional metrics. The inclusion of human and ecological wellbeing into our measurement and decision making necessarily requires appropriately complex indicators (Costanza et al., 2009; Stiglitz et al., 2009; Bishop & Green, 2011; Delhey & Kroll, 2012). The “social indicators movement” of the 1960s and 1970s sought to complement existing economic metrics with new indicators that painted a picture of life outside of the market and provided the basis for much of the subsequent work on “wellbeing” (Land & Michalos, 2018). Around the same time, concerns were rising about humankind’s ignorance of ecological boundaries and the need to correct for market failures that contributed to environmental crises through new metrics defined in terms of economic, social, and ecological sustainability (Meadows et al., 1972; Daly, 1977; World Commission on Environment and Development, 1987; Stiglitz et al., 2009). Over the past few decades, researchers and policymakers have taken up the call to design and develop alternative, “beyond GDP” indicators that measure a more holistic sense of wellbeing.

The Rise of Wellbeing Measurement

The slow rise of the concept of “wellbeing” as a complement to economic measurement is attributable to several factors. The social indicators and environmental movements noted above helped to build a foundation of support for the benefits of social and ecological services (i.e., sense of community, access to nature) and GDP’s negative impact on them (Beachy & Zorn, 2012). Advancements in statistics, computing, and data collection also contributed not only to the recognition of the growing “gap” between economic metrics and public perception, but consequently opened the possibility of measuring societal wellbeing in a more meaningful way (Beachy and Zorn, 2012). All these factors contributed to the spread of governments, researchers, the private sector, and citizens across the globe revisiting their purpose and priorities. Governments in particular were a critical recipient of these messages; as noted in a report to the United Nations titled *Happiness: Towards a holistic approach to development*

(2013), “the pursuit of happiness is a stated objective in many national constitutions, and the creation of an enabling environment for improving people’s well-being is a development goal in itself” (p. 3).

With various academic disciplines, cultures, and governance scales approaching the same general framework from distinct ideologies, priorities, and backgrounds, the lexicon of “wellbeing” is varied - and at times, confusing. While the term “wellbeing” has been charged with ambiguity in this context (Gasper, 2004), it is used in this paper because it is commonly employed across disciplines - in part due to its very ability to represent multi-dimensionality. In the seminal Stiglitz-Sen-Fitoussi (2009) report, the authors define wellbeing as having eight dimensions: material living standards (including income), health, education, personal activities, political voice and governance, social connections and relationships, environment, and insecurity, of an economic as well as a physical nature. The OECD has a similar multi-dimensional definition of wellbeing, as seen in Figure 1.

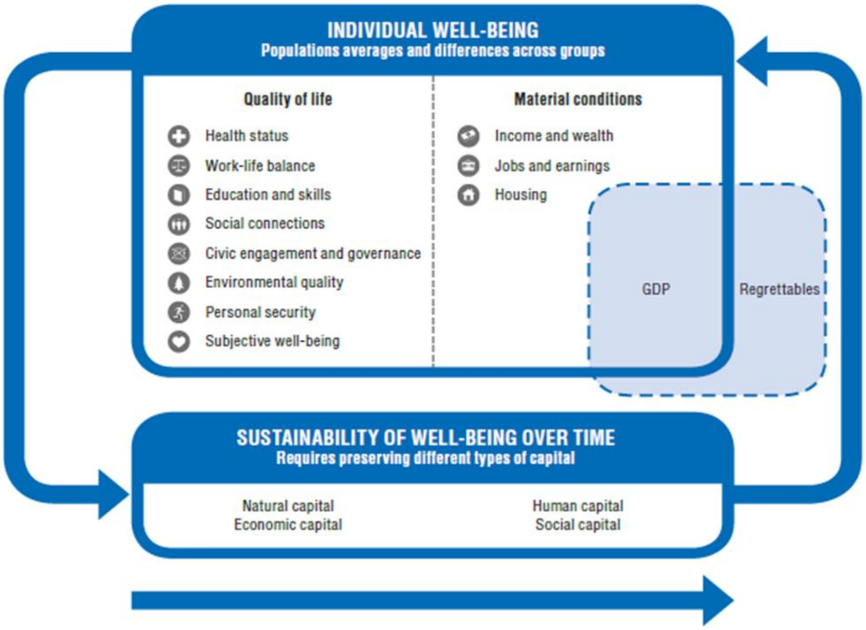

Figure 1. The OECD wellbeing conceptual framework. (OECD, 2014, p.21)

However, these dimensions are not standardized, and producers of new indices often choose different components to include that are more relevant for their population. Similar theoretical concepts may include “Degrowth,” Herman Daly’s “Steady-State Economy,” and Kate Raworths’ “Doughnut Economics.” “Beyond GDP” is another commonly used term often in reference to or derived from the European Union’s initiative of the same name, but also because it aptly describes a major distinguishing feature of the movement: the ultimate purpose of alternative indicators, in the view of those who employ this term, is that they are valued with the same weight as historical economic indicators. As defined by the leading author of the EU’s Bringing Alternative Indicators Into Policy (BRAINPOoL) project report, Beyond GDP are “those indicators and indicator sets that have been proposed as necessary and central to the measurement of societal progress in a broad sense, other than those indicators, such as GDP or the unemployment rate, that are already playing this role" (Whitby, 2014, p. 3). Whitby, Stiglitz, and others similarly stress the need to define what is meant by the use of Beyond GDP/Wellbeing indicators in policy - specifically, that they are used to design and evaluate policies, in the same way as GDP.

In addition to the variety of definitions, there are also different frameworks that have been developed to describe new types of measures or conceptual approaches, as presented in Table 1 below. There is consistency among the typologies presented; all five frameworks include an "adjusted GDP" type, four that specifically measure aspects of wellbeing outside of economic activity (such as subjective wellbeing and environmentally focused measures), and three include "composite indices." Yet, it should be noted that most of the categories within and between the typologies are not mutually exclusive. For example, in the typology provided by Costanza et al. (2009), the Genuine Progress Indicator (GPI) is given as an example of "GDP corrections," though it is also a composite index. Keeping this overlap in mind, we briefly describe here the three types of alternative measures proposed by Costanza et al. (2014), which are the most common types identified in the five studies listed.

Table 1. Typologies of "wellbeing" indicators and frameworks

Author	**Framework**	**"Adjusted GDP"**	**Non-Economic Measures**	**Composite Indices**	**Dashboards**	**Other**
Costanza et al., 2009	"New measures"	GDP corrections	Direct WB measurement	Composite indexes	Indicator suites	
	Examples provided:	*GPI*	*GNH*	*HDI*	*SDGs*	
Stiglitz et al., 2009	"Sustainability measures"	Adjusted GDP	Indicators focusing on overconsumption	Composite indices	Dashboards	

			or underinvestment			
	Examples provided:	*GPI*	*Ecological Footprint*	*Index of Economic Wellbeing*	*EU Sustainable Development Strategy*	
Delhey & Kroll, 2012	“Strategies for moving "beyond GDP"”	Healing GDP	Replacing GDP			Complementing GDP
	Examples provided:	*GPI*	*With SWB: GNH; Without SWB: SDI*			*With SWB: Better Life; Without SWB: HDI*
Costanza et al., 2014	“Alternative measures”	Adjusted economic measures	Subjective measures of WB	Weighted composite measures		N/A
	Examples provided:	*GPI*	*GNH*	*HPI*		N/A
van den Bergh et al., 2014	“Alternative indicators”	GDP Adjustment	Green GDP	Composite index		Genuine savings (or genuine investment)
	Examples provided:	*GPI*	*Sustainable National Income*	*HDI*		*World Bank ‘adjusted net savings’.*

Note. “GDP” = gross domestic product; “SNA” = systems of national accounts; “WB” = wellbeing; “SWB” = subjective wellbeing; “GPI” = genuine progress indicator; “GNH” = gross national happiness; “HDI” = human development index; “SDGs” = sustainable development goals; “SDI” = social development index; “HPI” = happy planet index.

“Weighted composite measures” combine individual indicators into a single index to measure a multi-dimensional concept (Costanza et al., 2016; OECD, 2008). More recently, these indices contain both subjective and objective indicators. The OECD Better Life Index is such an example, though it allows users themselves to adjust the weighting of indicators to create an index via an online platform (as compared to others that assign weighting proactively). In contrast with GPI, which “heals” GDP, and GNH, which “replaces” GDP, Better Life aims to “complement” GDP (Delhey & Kroll, 2012). The pioneering *How’s Life?* report released in 2011 by the OECD described the findings of the Better Life Index, comparing measures of wellbeing across forty OECD countries. While the simplicity of composite indicators can facilitate the communication of complex metrics with the general public and policymakers and enable comparison and evaluation, these very benefits can also mask issues with validity and result in crude conclusions and inappropriate use (OECD, 2008).

"Adjusted economic measures" are indicators or indices expressed in monetary units so as to be comparable to GDP. This comparability has been used to display the inconsistency between GDP and adjusted economic measures as a signal of GDP's limitations. In addition, by 'simply' adjusting the use and understanding of existing measures, these types of measures can provide for a smoother transition to alternative systems. One prominent example is the Genuine Progress Indicator (GPI), a composite index based on the Daly and Cobb's Index of Sustainable Economic Welfare (1989). As a measurement of the economic welfare generated by economic activity, GPI is intended for use in conjunction with other metrics of social and ecological wellbeing; yet, "because the GPI makes additions and subtractions to GDP to reflect net contributions to [societal wellbeing] it is a far superior measure of economic welfare…" (Kubiszewski et al., 2013). To calculate this metric, personal consumption expenditures are combined with over 20 variables to account for externalities left out by GDP. While most GPI estimates have been performed by academic groups or NGOs, GPI has been formally adopted more recently by four U.S. states: Vermont, Maryland, Washington and Hawai'i. GPI and similar measures are critiqued based on the difficulty of calculating an accurate cost for things that generally have no cost, which in some cases means that important aspects of wellbeing are excluded – such as subjective wellbeing (M. V. Fox, 2017).

"Subjective measures of wellbeing" include indicators that measure how people experience their own lives, often through population surveys. The term is generally considered to consist of three distinct dimensions: life satisfaction (an evaluative judgement), pleasant affect (the presence of positive emotions), and unpleasant affect (the absence of negative emotions) (Diener et al., 1999). The country of Bhutan's gross national happiness (GNH) index was the first national level initiative to actively shift away from GDP prioritization towards wellbeing, with subjective wellbeing recognized as a critical aspect; one of the stated purposes of the initiative is to set "an alternative framework of development" (Ura, Alkire, Zangmo, & Wangdi, 2012, p. 10). As a collection of various indicators that are categorized and presented as nine separate domains, the GNH index approach is known as a "dashboard" approach to wellbeing measurement. Taken together, citizens are identified as "unhappy," "narrowly happy," "extensively happy," or "deeply happy." Citizen input is gathered through extensive surveys that ask questions related to each domain; eight subjective questions make up the "psychological wellbeing" domain, and are also included in "health," "governance," and "ecological diversity and resilience" (Centre for Bhutan Studies & GNH Research, 2016). Extensive cross-disciplinary research on subjective wellbeing has led to its inclusion in many new measures of progress, though a general criticism is the inherent difficulty of measuring subjective judgements. Many wellbeing scholars today agree that subjective indicators are a critical aspect of wellbeing measurement. Subjective wellbeing measurement approaches often vary by discipline; in Article 2, the definitions and distinctions between terms of subjective wellbeing (“subjective wellbeing” differing from “wellbeing” as a term that refers specifically to how individuals perceive their own lives) including “Quality of Life,” “Life Satisfaction,” and “Happiness” will be discussed.

Gaps in the Literature

Despite the plethora of research related to the shortcomings of macroeconomic indicators and the potential need for and of new measures of wellbeing, the literature has yet to explore more deeply the use of these measures in practice, that is, public policy and decision making (Munda, 2015; Nourry, 2008; Whitby, 2014). While some government agencies, such as those in the U.K., Australia, and Belgium, have recognized and begun to measure wellbeing indicators, they are generally not integrated into a ““systemic” theoretical framework,” (Chancel et al., 2014, p. 26); as explained by Wallace and Schmuecker (2013), “Only when the priorities of policymakers change in response to the analysis of wellbeing measures can we say that measuring wellbeing matters” (p. 8). Many researchers have noted the need to specify what is meant by “wellbeing indicators in public policy,” yet there is still a lack of knowledge regarding their use and impact, including the prerequisites for their use in policy (Beachy & Zorn, 2012; Chancel et al., 2014; Exton & Shinwell, 2018; Wallace & Schmuecker, 2013).

Much of the literature has been focused at international and national levels, and most of the synthesis of policy use has been conducted by the OECD, European Union, and other high-level organizations; thus, discussions of the use of wellbeing measures at local (city, regional, state) levels have been largely left out. This is a significant loss, as some have found small-scale initiatives to be successful in moving from measurement to utilization; in Wallace and Schmuecker's (2013) analysis of eight case studies of relatively advanced wellbeing initiatives (ranging from city to international scale), Virginia Performs – an annual report published by the State of Virginia – was the only to have integrated wellbeing measures into performance management systems.

This thesis considers the implementation and potential of wellbeing indicator systems in the U.S. state of Vermont. I begin with a case study analysis of four wellbeing indices at the regional and state level in Vermont. The case studies provide contextual background describing the impetus and development of each wellbeing initiative. The similarities, differences, and connections between each case study are further examined based on a general program theory of wellbeing measurement. The second article narrows in on one specific wellbeing index: the 2017 Vermont Happiness Index, a representative statewide survey of subjective wellbeing. The survey results are analyzed through statistical testing, and recommendations for future research are provided. A better understanding of specific measurement tools, public and political interest in data collection, and shared experiences can help to fill the current gap in the literature and provide useful information for decision-makers.

References

Bagstad, K. J., Berik, G., & Brown Gaddis, E. J. (2014). Methodological developments in US state-level Genuine Progress Indicators: Toward GPI 2.0. *Ecological Indicators*, *45*, 474–485. https://doi.org/10.1016/j.ecolind.2014.05.005

Beachy, B., & Zorn, J. (2012). *21st Century GDP: National Indicators for a New Era*. Retrieved from https://web.archive.org/web/20150701192803/https://www.hks.harvard.edu/content/download/67149/1241406/version/1/file/PAE+Beachy_Zorn_2012.pdf

Bishop, M., & Green, M. (2011). We Are What We Measure. *Policy Journal*, *28*(1), 11–15. Retrieved from https://muse.jhu.edu/article/450501

Centre for Bhutan Studies & GNH Research. (2016). *A Compass Towards a Just and Harmonious Society: 2015 GNH Survey Report*. Thimphu. Retrieved from www.bhutanstudies.org.bt

Chancel, L., Thiry, G., & Demailly, D. (2014). *Beyond GDP indicators: to what end?* Paris, France. Retrieved from www.iddri.org

Chappell, B. (2019). U.S. Income Inequality Worsens, Widening To A New Gap : NPR. Retrieved November 3, 2019, from https://www.npr.org/2019/09/26/764654623/u-s-income-inequality-worsens-widening-to-a-new-gap

Costanza, R., Daly, L., Fioramonti, L., Giovannini, E., Kubiszewski, I., Mortensen, L. F., … Wilkinson, R. (2016). Modelling and measuring sustainable wellbeing in connection with the UN Sustainable Development Goals. *Ecological Economics*, *130*, 350–355. https://doi.org/10.1016/j.ecolecon.2016.07.009

Costanza, R., Hart, M., Posner, S., & Talberth, J. (2009). Beyond GDP : The Need for New Measures of Progress. *Boston University*, (4), 1–47. https://doi.org/0109 970401

Costanza, R., Kubiszewski, I., Giovanni, E., Lovins, H., McGlade, J., Pickett, K. E., … Wilkinson, R. (2014). Time to leave GDP behind. *Nature*, *505*, 283–285. Retrieved from www.asap4all.com

Cubasch, U., Wuebbles, D., Chen, D., Cristina Facchini, M., Frame, D., Mahowald, N., & Winther, J.-G. (2013). *Climate Change 2013: The physical science basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, United Kingdom and New York, NY, USA. Retrieved from http://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_Chapter01_FINAL.pdf

Daly, H., & Cobb Jr, J. (1989). *For the common good : redirecting the economy toward community, the environment, and a sustainable future*.

Delhey, J., & Kroll, C. (2012). *Human Happiness and the Pursuit of Maximization:Is More Always Better?* (Research Area Education, Work, and Life Chances, Research Unit Inequality and Social Integration, No. SP I 2012-201). https://doi.org/10.1007/978-94-007-6609-9

DeSilver, D. (2017). U.S. academic achievement lags that of many other countries | Pew Research Center. Retrieved November 2, 2019, from https://www.pewresearch.org/fact-tank/2017/02/15/u-s-students-internationally-math-science/

Diener, E., & Suh, E. (1997). Measuring quality of life: Economic, social and subjective indicators. *Social Indicators Research*, *40*(1–2), 189–216. Retrieved from https://link.springer.com/content/pdf/10.1023%2FA%3A1006859511756.pdf

Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective Well-Being : Three Decades of Progress. *Psychological Bulletin*, *125*(2), 276–302.

Easterlin, R. A. (1974). Does economic growth improve the human lot? Some empirical evidence. *Nations and Households in Economic Growth*, 89–125. Retrieved from http://graphics8.nytimes.com/images/2008/04/16/business/Easterlin1974.pdf

Easterlin, R. A. (1995). Will raising the incomes of all increase the happiness of all? *Journal of Economic Behavior and Organization*, *27*, 35–47. Retrieved from http://ipidumn.pbworks.com/f/EasterlinIncomesandHappiness.pdf

European Commission. (2009). *GDP and beyond: Measuring progress in a changing world*. Brussels.

Exton, C., & Shinwell, M. (2018). *Policy use of well-being metrics: Describing countries' experiences* (OECD Statistics Working Papers). Paris. https://doi.org/10.1787/d98eb8ed-en

Fioramonti, L. (2013). *Gross Domestic Problem: The Politics Behind the World's Most Powerful Number*. https://doi.org/10.1080/19452829.2014.906214

Fox, M. V. (2017). *Designing for Economic Success: A 50-State Analysis of the Genuine Progress Indicator*. University of Vermont.

Gasper, D. (2004). *Human Well-Being: Concepts & Conceptualizations*. *The Institute of Social Studies*. https://doi.org/10.1177/002200202236166

Giovannini, E., & Tommaso, R. (2018). Going beyond GDP: theoretical approaches. In *Handbook of Research on Economic and Social Well-Being* (pp. 1–51). Edward Elgar Publishing.

Hansen, J. E. (2003). *Can we defuse The Global Warming Time Bomb?* New,York, NY. Retrieved from https://pubs.giss.nasa.gov/docs/2003/2003_Hansen_ha07900q.pdf

ILO. (2013). Measurement of the Informal Economy. In *The Informal Economy and Decent Work: A Policy Resource Guide*. Geneva: International Labour Office.

Retrieved from https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_policy/documents/publication/wcms_210443.pdf

Kahneman, D., & Krueger, A. B. (2006). *Developments in the Measurement of Subjective Well-Being*. *Journal of Economic Perspectives* (Vol. 20). Retrieved from https://pubs.aeaweb.org/doi/pdfplus/10.1257%2F089533006776526030

Kahneman, D., Krueger, A. B., Schkade, D., Schwarz, N., & Stone, A. (2004). Toward National Well-Being Accounts. *American Economic Review*, *94*(2), 429–434. Retrieved from https://www.jstor.org/stable/pdf/3592923.pdf?refreqid=excelsior%3Aeff886a2e78fdd395dc688e67ddbe91b

Karabell, Z. (2014). *The Leading Indicators: A Short History of the Numbers That Rule Our World*. Retrieved from https://books.google.com/books?id=NtgGBgAAQBAJ&printsec=frontcover&dq=karabel+2014&hl=en&newbks=1&newbks_redir=0&sa=X&ved=2ahUKEwjg-5_u387lAhXCdN8KHV2rA5sQ6AEwAHoECAAQAg#v=onepage&q&f=false

Kubiszewski, I., Costanza, R., Franco, C., Lawn, P., Talberth, J., Jackson, T., & Aylmer, C. (2013). Analysis Beyond GDP: Measuring and achieving global genuine progress. *Ecological Economics*, *93*, 57–68. https://doi.org/10.1016/j.ecolecon.2013.04.019

Kuznets, S. (1934). *National Income, 1929-1932*. New York. Retrieved from http://www.nber.org/chapters/c2258.pdf

Land, K. (1983). Social Indicators. *Annual Review of Sociology*, *9*, 1–26. Retrieved from www.annualreviews.org

Land, K. C., & Michalos, A. C. (2018). Fifty Years After the Social Indicators Movement: Has the Promise Been Fulfilled? An Assessment an Agenda for the Future. *Social Indicators Research*, *135*, 835–868. https://doi.org/10.1007/s11205-017-1571-y

Layard, R. (2010). Measuring Subjective Well-Being. *Science*, *327*, 534–535. https://doi.org/10.1126/science.1184703

Marcuss, R. D., & Kane, R. E. (2007). *U.S. National Income and Product Statistics: Born of the Great Depression and World War II*. United States . Retrieved from https://apps.bea.gov/scb/pdf/2007/02 February/0207_history_article.pdf

Max-Neef, M. (1995). Economic growth and quality of life: a threshold hypothesis. *Ecological Economics*, *15*, 115–118. Retrieved from https://ac.els-cdn.com/092180099500064X/1-s2.0-092180099500064X-main.pdf?_tid=c21d2ac1-c279-4f61-9593-4d24af0b4027&acdnat=1536692623_0572b7afb3b518211cc1d51b689c33cc

McNeil Jr., D. G. (2017). A Global Health Scorecard Finds U.S. Lacking - The New York Times. Retrieved November 3, 2019, from

https://www.nytimes.com/2017/05/22/health/health-care-global-united-states.html
Meadows, D., Meadows, D., Randers, J., & Behrens III, W. W. (1972). *The Limits to Growth: A Report to The Club of Rome* .
Munda, G. (2015). Beyond GDP: An overview of measurement issues in redefining "wealth." *Journal of Economic Surveys*, *29*(3), 403–422. https://doi.org/10.1111/joes.12057
Nations, U. (2013). Happiness: towards a holistic approach to development, *20817*(January), 17. https://doi.org/10.1017/CBO9781107415324.004
Nelson, C., Chandra, A., & Miller, C. (2018). Can Measures Change the World? *Stanford Social Innovation*, *16*(1), 42–47. Retrieved from https://search.proquest.com/docview/1967295751/fulltext/E96D6F2D6AA458APQ/1?accountid=28932
Nordhaus, W., & Tobin, J. (1972). *Is Growth Obsolete?* Retrieved from https://www.nber.org/chapters/c7620.pdf
Nourry, M. (2008). Measuring sustainable development: Some empirical evidence for France from eight alternative indicators. *Ecological Economics*, *67*, 441–456. https://doi.org/10.1016/j.ecolecon.2007.12.019
OECD. (2008). *Handbook on Constructing Composite Indicators: Methodology and UserGuide*. Retrieved from http://www.oecd.org/sdd/leading-indicators/42495745.pdf
OECD. (2011). *Compendium of OECD well-being indicators*. Retrieved from http://www.oecd.org/sdd/47917288.pdf
OECD. (2014). *How's Life in Your Region?: Measuring regional and local well-being for policy making*.
OECD. (2017). *How's Life? 2017*. OECD. https://doi.org/10.1787/how_life-2017-en
Sen, A. (1983). Development: Which way now? *The Economic Journal*, *93*(372), 745–762. Retrieved from https://www-jstor-org.ezproxy.uvm.edu/stable/pdf/2232744.pdf?refreqid=excelsior%3Ae7c1c72f09c1083026402e551259ad3a
Sen, A. (1990). Development as Capability Expansion. In K. Griffin and J. Knight (Ed.), *Human Development and the International Development Strategy for the 1990s* (pp. 41–54). London: Macmillan. Retrieved from http://morgana.unimore.it/Picchio_Antonella/Sviluppo umano/svilupp umano/Sen development.pdf
Stiglitz, J. E., Sen, A., & Fitoussi, J.-P. (2009). *Report by the Commission on the Measurement of Economic Performance and Social Progress*. Paris. Retrieved from www.stiglitz-sen-fitoussi.fr
The Library of Economics and Liberty. (n.d.). GDP . Retrieved November 3, 2019, from https://www.econlib.org/library/Topics/College/gdp.html

U.S. Bureau of Economic Analysis. (2019). Gross Domestic Product. Retrieved November 3, 2019, from https://www.bea.gov/data/gdp/gross-domestic-product

Ura, K., Alkire, S., Zangmo, T., & Wangdi, K. (2012). *An Extensive Analysis of GNH Index*. *The Centre for Bhutan Studies*.

van den Bergh, J. (2009). The GDP paradox. *Journal of Economic Psychology*, *30*(2), 117–135. https://doi.org/10.1016/j.joep.2008.12.001

van den Bergh, J., & Antal, M. (2014). *Evaluating Alternatives to GDP as Measures of Social Welfare/Progress* (No. 56). Retrieved from www.foreurope.eu

Wallace, J., & Schmuecker, K. (2013). *Shifting the Dial: From wellbeing measures to policy practice*. Retrieved from https://www.ippr.org/files/images/media/files/publication/2012/10/SHIFTING THE DIAL_WEBfinal_9826.pdf

Whitby, A. (2014). *The BRAINPOoL Project: Beyound GDP - From measurement to politics and policy*. Retrieved from www.brainpoolproject.eu

World Bank. (2017). GDP (current US$).

CHAPTER 2: VERMONT'S EXPERIENCE WITH WELLBEING INDICATOR SYSTEMS: A CASE STUDY ANALYSIS OF VERMONT, U.S.A.

Introduction

Vermont has been a leader in the United States in the acknowledgement of alternative measures of human wellbeing and progress: the State incorporated the Genuine Progress Indicator (GPI) into state statute as a key indicator in 2014; then-Governor Shumlin declared April 13th Pursuit of Happiness Day (commemorating the birthday of Thomas Jefferson, the man to thank for the phrase "life, liberty and the pursuit of happiness"); and academics and non-profit organizations have hosted a number of national conferences on GPI, Gross National Happiness (GNH), and other initiatives encouraging a redefinition of progress. According to the co-founder of the U.S.-based organization the Happiness Alliance, Vermont has become a "laboratory for promoting new ways of understanding and promoting happiness and wellbeing" (de Graaf, 2014).

Such efforts resulted from the growing recognition of a perceived overreliance on economic metrics. What we choose to measure, and how, affects our day-to-day lives - as the saying goes, "we are what we measure." Economic indicators such as Gross Domestic Product (GDP) have become overarching measures of wellbeing and progress, even though they were never meant to do so (Kuznets, 1934; Stiglitz et al., 2009). This misplaced confidence in narrow metrics has led communities around the world to undervalue aspects of life that are critical to societal wellbeing and survival. This undervaluation has taken on even greater urgency as the world faces rapidly shifting social, economic, and environmental realities related to climate change, biodiversity loss, globalization, immigration, automation and so on.

Vermont's actions placed the state within the emerging movement of "holistic" wellbeing measurement. Whether termed "wellbeing," "quality of life," "happiness," "beyond GDP," or "life satisfaction," these indicator movements have the same general goal of repairing our current indicator systems through adoption of new measurement tools and frameworks. While singular wellbeing indicators have been used for many years (i.e., birth rate), a wellbeing framework to guide decision-making and policy more directly shifts the current economic growth-focused narrative to a human-centered one. The definition of "wellbeing" is multidimensional (Bleys & Whitby, 2015; Diener, Wirtz, et al., 2009; Michaelson, Abdallah, Steuer, Thompson, & Marks, 2009; Stiglitz et al., 2009) and may be best understood as "an abstraction, that is used to refer to any of many well-evaluated aspects of life" (Gasper, 2004). A more recent and specific definition provided by Coutts and Wallace (2016) draws on the influential OECD Better Life Initiative and states, "Societal wellbeing is a multidimensional concept that describes progress in terms of improvements in quality of life, material conditions and sustainability" (p. 4).

The aim of this paper is to examine the development and implementation of three Vermont-based wellbeing indicator systems - the Genuine Progress Indicator (GPI), the Chittenden County Environment, Community, Opportunity, Sustainability (ECOS) Project, and the "Outcomes Bill" - in the context of the growing movement towards a more holistic and inclusive measurement of human wellbeing and ecological health. A fourth measurement initiative, the Vermont Happiness Index, has not yet been incorporated into a policy or decision-making framework but is also considered to elaborate on the range of concepts, methodologies, and strategies for wellbeing.

The goal of this research is to determine whether there are indicator systems at the regional or state level in Vermont that are used to complement traditional economic measures (e.g. GDP). The four case studies were chosen primarily based on their ability to be categorized as a wellbeing indicator system, their place in policy or decision-making, and their representation of different types and scales of indicator systems. The criteria used in this study to categorize a measurement tool as a "wellbeing" indicator system included that it measures social, economic, and environmental dimensions of life, and that it is considered - at some level or by some significant stakeholder group - to be a possible complement to macro-economic indicators. While other research has examined case studies to inform the field of wellbeing (see (Chancel et al., 2014; Coutts & Wallace, 2016; Durand, 2018; Whitby, 2014), this study is unique in focusing primarily on policy implementation at the sub-national level in one U.S. state.

The structure of the paper is as follows. A literature review highlighting recent advancements in wellbeing measurement, characteristics of wellbeing frameworks, and the challenges and opportunities of integration into policy use is provided. Then, we describe the background and implementation each of the four case studies. The methodology and framework for the case study analysis is described. Finally, we conclude with a discussion summarizing the implications of the different indicator systems and how Vermont can learn from these experiences to move forward in wellbeing measurement.

Literature Review

Advancements in Wellbeing Measurement

Indicator systems were first implemented widespread following World War II, with the introduction of the Gross Domestic Product (GDP) and National Systems of Accounts; though created specifically to measure economic production, GDP and similar metrics have become de facto proxies for societal wellbeing (Kuznets, 1934; Stiglitz et al., 2009; Kroll & Delhey, 2013). The international community and academic literature point to several limitations of GDP as a wellbeing metric (European Commission, 2009; Stiglitz et al., 2009; OECD, 2013; United Nations, 2013; Exton & Shinwell, 2018), including:

1. GDP only accounts for those transactions that can be measured monetarily within the market system, thus leaving out those goods and services that do not have a price associated with them (van den Bergh, 2009; ILO, 2013);
2. GDP counts all market transactions the same and does not account for society's positive or negative valuation of that transaction (Giannetti, Agostinho, Almeida, & Huisingh, 2015);
3. As an indicator of economic growth, GDP has been shown to be less relevant as an indicator of subjective wellbeing after securing human needs (Easterlin, 1974; Max-Neef, 1995; Diener & Suh, 1997); and,
4. As a broad composite indicator, GDP can mask economic inequalities and factors related to relative income (Sen, 1976; Daly & Cobb, 1989).

Within the past two decades, an international "Beyond GDP" movement to develop alternative or complementary wellbeing measures has gained momentum from key actors such as the OECD, Eurostat, World Bank, and National Statistical Offices; new wellbeing initiatives can now be found through local, national, and international governance and organizational efforts around the world. A major focus of the movement has been the transition from simply *measuring* wellbeing to *using* wellbeing data for decision-making. As described by Whitby (2014), the integration of a wellbeing framework continues to the "fundamental problem...that in the negotiation of trade-offs between economic, environmental and social policy objectives, it is economic objectives that still trump others" (p. 3).

By virtue of putting individual wellbeing at the center of the measurement objective, as opposed to aggregate economic growth, wellbeing frameworks can provide a more complete picture of societal progress (Stiglitz et al., 2009; Balestra, Boarini, & Tosetto, 2018; Durand, 2018). Coutts and Wallace (2016) note that this approach differs from traditional indicators by moving from inputs to outcomes, shifting the focus onto the effect of policies or events on people and the environment. Wellbeing frameworks can further contribute to (Coutts & Wallace, 2016; Durand, 2018):

1. The alignment of outcomes among government agencies by breaking down silos;
2. The prioritization of people and outcomes over aggregate economic measures by "highlighting inequalities and the diversity of experience through providing data at the granular, people-centered level" (Durand, 2018, p. 214);
3. The consideration of the quality and sustainability of economic growth;
4. The inclusion of public debate and shared ownership of initiatives; and,

5. The increase in accountability and transparency of the effects of trade-offs and policy spill-overs by evaluating the impact of policy interventions on people and the environment.

Governmental entities and leaders are now acknowledging and seeking out these benefits; still, the exact structure of and approach to wellbeing measurement frameworks varies widely.

Wellbeing Measurement Frameworks

Different wellbeing indicator systems have been proposed or implemented with varied motivations, approaches, structures, and levels of success. Still, there are several framework commonalities that unite many of the systems. Most recognized wellbeing indicator systems have been developed by academics or governance institutions at the local, national, and international levels in response to the desire for more accurate assessments of wellbeing and progress, though there remains a lack of consensus on what should be measured, how it should be measured, to who and how it should be communicated, and where - or if - it should be implemented in public decision-making. To some extent consensus may not be required, as Durand (2018) and others argue that there is no one-size-fits-all tool for wellbeing measurement.

Motivation & Purpose. Beyond the more accurate measurement of wellbeing, the specific purpose of each indicator system differs depending on the project's leadership and intended outcome; while some are explicitly developed to be used in policy settings, others serve more simply to provide additional information for general users (Whitby, 2014; Durand, 2018). In a review of cities and regions that have used the OECD Regional Wellbeing Framework, Coutts and Wallace (2016) found a shared purpose of "understanding social progress 'in the round'" (p. 5), though the reasons for doing so range from greater understanding of quality of life among different populations to governmental performance measurement.

One critical consideration for the initiation of a wellbeing indicator system is the theoretical framework and definition of what is meant by "wellbeing" (Diener et al., 2009; Coutts & Wallace, 2016; Barrington-Leigh & Escande, 2018). In their extensive review of measures of wellbeing and progress, Barrington-Leigh and Escande (2018) argue for the importance of basing the definition of these concepts on a theoretical framework to provide transparency to the process - particularly for top-down measures. The authors found that while many index developers cite stakeholder or expert engagement, absent a clear theoretical framework the decision-making process - and thus the legitimacy of the initiative - remains unclear. The theoretical framework may be based, for example, on research-based models or existing wellbeing indicator systems. A more localized framework may also be developed by engaging in a stakeholder process. Alternatively, Barrington-Leigh and Escande categorize bottom-up measures as "more empirical, or atheoretical" (p. 910) that solicit input from the population that the indicator system seeks to measure.

A second choice in determining the purpose of the project is whether the audience is meant to consist of policy makers, academics/experts, the public, or other decision-makers (Hezri & Dovers, 2006; Tommaso, Signore, Fazio, Calza, & Righi, 2014).

Different audiences have different needs, and understanding these needs may lead project developers to take a specific approach; as Whitby (2014) points out, “Indicators are by definition communication tools and it is the capacity of the indicator to reach its target audience that to a large extent determines its use and potential impact” (p. 14). For instance, the Australian Bureau of Statistics developed the wellbeing[1] index Measures of Australia’s Progress (MAP) for the *public*, a deliberate decision meant to prioritize "the nation's, not the government's progress" (Trewin & Hall, 2004, p. 8). Thus, MAP’s chosen approach, dimensions and indicators of progress, and communication strategy were developed with the public in mind. Prioritizing the quality or “fitness for use” of an index is crucial to building legitimacy and meaning for the end-user, which is just as important to its success as the accuracy of the data (OECD, 2008; Tommaso et al., 2014). The OECD’s Handbook on Constructing Composite Indicators (2008) explains the concept of fitness for use: “Even if data are accurate, they cannot be said to be of good quality if they are produced too late to be useful, or cannot be easily accessed, or appear to conflict with other data” (OECD, 2008, p. 44).

Structure & Approach. Wellbeing is understood as a multidimensional concept that requires a multidimensional approach to measurement (Exton & Shinwell, 2018; Durand, 2018). To accomplish this, wellbeing indicator systems measure several different concepts that developers choose based on prior research, project purpose, stakeholder engagement, and data availability. “Domains” of wellbeing are often created to provide a

---

[1] While referred to here as a “wellbeing index,” MAP developers specifically chose the term “progress” over “quality of life,” “wellbeing or welfare,” and “sustainability”; however, their definition of progress - “which...aspects of life - environmental, social and economic - are improving” - is similar to broader understandings of wellbeing.

more accurate measurement of overarching concepts, such as physical health or financial security, by aggregating multiple indicators (Coutts & Wallace, 2016). Domains may include both subjective and objective indicators and may be collected from different datasets (Exton & Shinwell, 2018). Decisions made during the domain development and analysis process can greater influence the resulting data, as well as the legitimacy and validity of the measurement tool; thus, transparency around decision-making is necessary (Trewin & Hall, 2004; Barrington-Leigh & Escande, 2018).

Just as developers may consult stakeholders in choosing a theoretical framework, stakeholder engagement is an important component throughout different stages of the development process (Stiglitz, 2009; Exton & Shinwell, 2018; Durand, 2018). Trewin and Hall (2004) argue that indicator systems can be strengthened by gathering feedback from and providing a platform for community members; it helps to gain broader insight from those "on the ground," and builds legitimacy through community buy-in and ownership. While the literature generally recommends a stakeholder process, many indicator systems continue to be built through a top-down approach; this may be due to limited resources, or an attempt to create a foundational indicator system that can be customized with more community feedback at smaller scales (examples include the Happiness Alliance's Happiness Index and the OECD Better Life Index).

Challenges & Opportunities of Policy Use

While there has been a recent increase in wellbeing measurement, the translation of measurement into policy action has been limited. Durand (2018) found that there continues to be a "...risk that newly developed indicators may become "just another report" rather than leading to a substantial change in the setting and framing of policy" (p. 212). "Substantial change" refers to the use of wellbeing indicator systems at high level policy decision-making, in "contexts where GDP is currently used, as integrated decision-making tools" (Whitby, 2014, p. 3). In their summary of the European Union's BRAINPOoL (Bringing Alternative Indicators Into Policy) project, Whitby et al. (2014) identify three fundamental barriers to the integration of wellbeing indicators into policy:

1. *Political*. Policy-makers are unlikely to support or champion an indicator proposal that lacks legitimacy or has a poorly defined narrative. Further, without constituent demand there is a lack of political imperative to address the limitations of current measures (Durand, 2018).
2. *Indicator*. Disagreements over methodology and theoretical frameworks leave alternative indicator systems open to criticism regarding their quality, validity, and fitness for use. This is an area of particular focus for measures of subjective wellbeing.
3. *Process & Structural*. Shifting away from the current system in any form is difficult; institutions are historically resistant to significant change. Change is further stifled given limited understanding of the need to shift and available alternatives.

The sheer number of alternative indicator systems measuring "wellbeing," "sustainability," "resiliency," and other related, complex concepts has clouded meaning and understanding of specific proposals (Whitby, 2014). The presentation of the data and perceptions of the presenter themselves further contribute to the level of legitimacy and acceptance of the project; for instance, while the leadership of a prominent political figure may help implement an indicator system, that system may suffer in the long run from being connected with a specific political party or politician (Trewin & Hall, 2004; Chancel et al., 2014).

Despite these challenges, the largest potential impact of and opportunity for wellbeing indicator systems comes through their use throughout the policy cycle: agenda setting; policy formulation; implementation; monitoring; or evaluation. Durand (2018) found many wellbeing indicator systems have been developed to contribute to the agenda-setting, policy formulation, and evaluation stages. To do so, they have employed separate tools and mechanisms for policy integration. The United Kingdom's Measures of National Wellbeing Programme (MNWP) for example collects wellbeing data within ten domains, which is then used to inform the Green Book, the Treasury's guidance document for budgetary decisions; the UK government also created the independent What Works Centre for Wellbeing to support policymakers' use of wellbeing data in decision-making (Chancel et al., 2014; Bache, 2015).

Methodology

Case Studies

This study examines the current status of wellbeing indicator systems in the state, including how they were developed and the extent to which they have been integrated into decision-making. A descriptive case study methodology was chosen to illuminate this research question. Given the small number of initiatives in Vermont, purposive sampling was used to identify a more representative sample of case studies; the chosen case studies represent a variety of different dimensions common among wellbeing indicator systems, such as purpose, scale, and audience. To identify wellbeing initiatives, we first looked at state-level examples of more familiar indices, such as the GPI and GNH (off which the Vermont Happiness Index was based). Many community indicator projects do not self-identify as measuring "wellbeing," which is an issue for future research. To resolve this, search terms such as "quality-of-life" were used to find indicator systems that did indeed meet our criteria for a "wellbeing" index: one that measures social, economic, and environmental dimensions of life, and that are considered - at some level - to be a possible complement to macro-economic indicators. While we did not find additional wellbeing indicator systems in Vermont through this research, this is not meant to be an exhaustive list. Instead, these four case studies were moved forward as useful representations of recently implemented indicator systems produced and used at different scales, for different audiences, and for different purposes, as shown in Table 2.

Table 2. Summary of case study characteristics

	Year	**Developers**	**Purpose**	**Audience**	**Structure**
VT Genuine Progress Indicator	2012	Academics	Budgetary and policy priorities & decision-making	State government	Adjusted GDP
Chittenden County ECOS	2010	Community Organizations	Track progress	Regional organizations	Dashboard
VT Happiness Index	2013	Non-Profit	Complement population indicators	All	Subjective wellbeing
VT Outcomes Bill	2014	State & Non-Profit	Performance management	State government	Dashboard

Case Study Analysis Framework

This research examined the case studies through the lens of a general wellbeing measurement program theory. Program theory refers to “an explicit theory or model of how the program causes the intended or observed outcomes” (Rogers, Petrosino, Huebner, & Hacsi, 2000), which can be used to guide policy and program evaluation by “identifying key program elements and articulating how these elements are expected to relate to each other” (Cooksy, Gill, & Kelly, 2001). A general program theory of wellbeing measurement was developed through a “policy-scientific approach” (Leeuw, 2003) based on the literature described above and examples of current indicator systems used in public policy. A policy-scientific approach to program theory aims to generate and test program theory assumptions through methods including a review of research and documents (McLaughlin & Jordan, in Newcomer, Hatry, & Wholey, 2015).Logic models are a common tool of choice to describe program theories (Cooksy, 2001; Botein & Hetling, 2010; McLaughlin & Jordan, in Newcomer et al., 2015); this research employs the logic model framework to operationalize the general program theory of wellbeing measurement, and then to examine how each case study fits within the framework. The framework also establishes boundaries for the study and provides a focus for the data collection and analysis. Figure 1 displays the conceptual framework for the case study analysis; the design is based on Martinson and O’Brien in Newcomer et al. (2015), where “Motivations” represents the input of general logic models, “Development” represents process, and “Integration” represents output/outcomes.

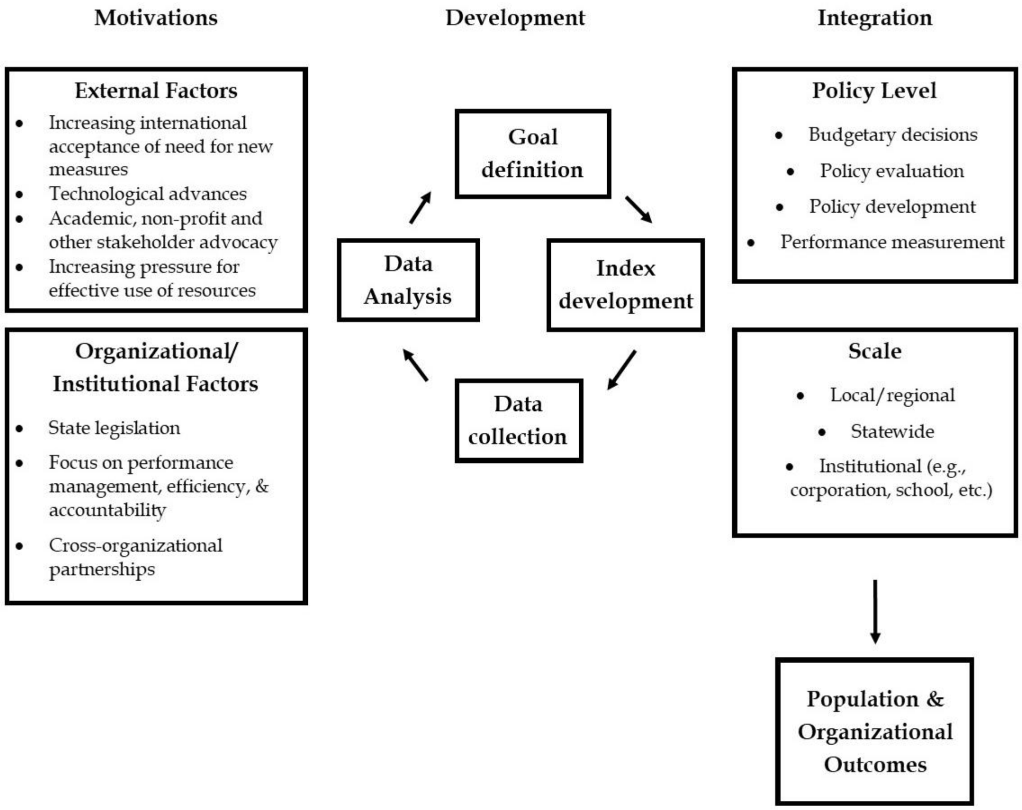

Figure 2. Conceptual framework of wellbeing indicator systems

Analysis of the case studies was conducted using data sourced from reviews of documents (e.g. legislation, agency reports, published articles, etc.) and data communication tools (e.g. indicator dashboards). This information was used to paint a picture of how and why the indicator systems were developed, and their current position in public decision-making. The motivations, development, and integration of the case studies are described through the historical context, political conditions, project purpose, development of indicators, and extent of integration into policy-making of each. These themes were based on recent case study research by Exton and Shinwell (2018). Further analysis considers the similarities, differences, and connections between the case studies through their implementation in the policy process (or lack thereof), fitness for use, and implications for wellbeing measurement in Vermont, as overarching concerns regarding population and organizational outcomes.

Vermont Wellbeing Indicator Systems

Genuine Progress Indicator

Background. The State of Vermont passed legislation in 2012 incorporating the Genuine Progress Indicator (GPI) into state decision-making and budgeting. GPI is a composite economic indicator created by the public policy organization Redefining Progress and based on Daly and Cobb's Index of Sustainable Economic Welfare (ISEW), an alternative metric developed to account for the social, economic and environmental dimensions needed for a clearer picture of the "total well-being of people" (1989, p. 377). Originally calculated for the United States between 1950-1986, the results revealed that while ISEW grew with GDP through the 1950s, the two measures diverged in the 1960s with GDP rising and ISEW stagnating or declining - thus showing the need for a measure to complement GDP by accounting for those formerly-excluded dimensions. This gap in wellbeing is illustrated by other theories such as Max-Neef's (1995) "threshold hypothesis," which argues that economic growth only contributes to quality of life up to a certain threshold point. The use of GPI in Vermont is adapted for regional use, in order to understand local differences and influence policy decisions.

Political conditions. GPI emerged during a time of increasing interest in moving "beyond GDP" and finding new measurements of wellbeing and sustainability around the world. It benefitted from an engaged academic community, which had calculated the GPI for a multitude of countries and states showing a gap between GPI and GDP (or GSP, at the state level), thus bolstering the argument for alternative measures. Several U.S. states have implemented or considered use of GPI in state government including Hawaii, Minnesota, and Washington. Vermont was the first state to legislate the use of GPI in policymaking, two years after Maryland developed the Maryland Quality of Life Initiative with GPI as its key indicator; the political aim of the bill was for GPI to be used to impact state budgetary and policy decision-making and priorities.

GPI in Vermont was supported largely by the Progressive Party, a political third party in the state, and championed by long-time legislator Senator Anthony Pollina (P/D). Pollina argued that since GDP is “clearly out of touch with economic reality,” GPI provided an opportunity to redefine budgetary success and priorities by focusing “on what is really happening to our families, environment and economy” (Pollina, 2011); a similar sentiment was shared by state leaders outside of the State House as well, including then-Secretary of Agriculture, Food & Markets Chuck Ross (Panebaker, 2012). While the bill, S. 237/Act 113, passed with overwhelming support in the Senate and 97-41 in the House of Representatives, it was not without criticism and concern. Representative Anne Donahue (R-Northfield) expressed her concern on the House floor: “To endorse a bill that attempts to put numbers on abstract values without a legislative endorsement of the product prior to implementation is an irresponsible delegation of our responsibilities” (Panebaker, 2012). Another House member, Rep. Heidi Scheuermann (R-Stowe), said that, “the Genuine Progress Indicator (otherwise known as the Happiness Index) will be used as a tool to avoid addressing the real economic challenges facing

Vermont families and businesses" (Panebaker, 2012); as the Happiness Index (described as one of the case studies below) is a separate measurement tool, it is possible that the purpose and specifics of GPI did not reach all legislators. Further, the Shumlin Administration never publicly embraced GPI and the bill's supporters were met with "some resistance" (Fox & Erickson, 2018).

Political support for GPI was largely driven by the Gund Institute of the Environment (formerly of Ecological Economics) at the University of Vermont. The Gund Institute has housed several GPI experts, including Robert Costanza and Jon Erikson, who led the first U.S. state-level GPI study (Costanza, et al., 2004). Gund academics established Vermont as a hub for GPI research, through the organization of online listservs, recurring conferences, and other efforts (Fox, 2017). The ability for legislators to partner with an established, local research institution was paramount for the success of the bill; not only could the researchers provide expert testimony, but in fact the law designated the Gund as a partner organization to "establish and test a genuine progress indicator," and to "create a Vermont data committee" (Vermont Act 113, 2012).

Purpose. As a single, monetary measure, GPI is easily comparable to GDP for lawmakers and the general public. Eric Zencey (2018), author of the Vermont GPI reports, describes GPI as "...an indicator of the net wellbeing the economy creates" (p. 8). More specifically, the intention of GPI supporters was that the indicator would be used in determining budget and public policy priorities, for example through use in cost-benefit analyses (Erickson, Zencey, Burke, Carlson, & Zimmerman, 2013; Panebaker, 2012). Sen. Pollina also saw a potential benefit for those working to further social and environmental issues that often succumb to fiscal concerns. The written purpose in the law itself explains that, “the GPI will assist state government in decision-making by providing an additional basis for budgetary decisions, including outcomes-based budgeting; by measuring progress in the application of policy and programs; and by serving as a tool to identify public policy priorities, including other measures such as human rights.”

Development of indicators. Accepting that economic consumption has a significant role in human wellbeing, GPI adjusts personal consumer expenditure, a key component of GDP. Subtracted from it are calculated costs for income inequality, environmental degradation, defensive private expenditures and depreciation of natural capital, and added are calculated benefits from domestic labor, non-defensive public expenditures and other economic adjustments. Despite the initial hesitation from the executive branch, Gund researchers ultimately worked with the administration to develop Vermont-specific GPI factors. The Vermont GPI benefitted from having a state-level analysis already completed (Costanza et al., 2004); in fact, as the Vermont study was the first in the U.S., the “Vermont/Maryland” method emerged as a standard (Fox, 2017). The legislation further charged the Gund Institute to:

1. Build the database to produce annual GPI estimates;
2. Work with Vermont’s Secretary of Administration to institute a data advisory group representing the broad public, private, and civil society interests included in GPI;
3. Develop and test the use of GPI in state public policy and budget analysis; and
4. Review and propose additional factors to enhance the standard GPI.

Integration into policy-making. Biennial reports on Vermont's GPI are produced and required by law to be presented to the house and senate committees on government operations and economic development. The GPI reports identify points of potential action, including investments in conservation and socially desirable development, highlighting both where Vermont is doing well (i.e., unemployment, ozone depletion) and is struggling (i.e., income inequality, water pollution) (Zencey, 2018). Perhaps the most notable incorporation of GPI into policy-making in Vermont has been its inclusion in the state's 2020 Comprehensive Economic Development Strategy (CEDS), where "The overarching goal for this Comprehensive Economic Development Strategy is to increase the Genuine Progress Indicator by 5% over the national baseline by 2020" given GPI's "more complete view of economic growth" (Agency Commerce & Community Development, 2016, p. 26).

However, it has been challenging for GPI to move beyond measurement and into policymaking in Vermont. While the project was initially a national model and has benefited from a dedicated academic expert to provide suggestions for improvement, no funding has been appropriated. As a result, the project has fallen behind other states in updating its methodology and has not had the advocacy power to hold state lawmakers accountable in using GPI in policy-making and budgeting - as prescribed by law (Zencey, 2018). In fact, the main developer of the GPI reports, Eric Zencey, stated following the release of the 2018 update that his pro-bono work would no longer continue; it is unclear who would take up his work. The integration of GPI is also faced with the difficulty of collecting and reporting on data in a timely manner; while GPI benefits from its ability to be easily compared with GSP/GDP, Vermont's GPI is reported with a 3-year time lag, whereas GSP numbers are released on a much more regular basis (Zencey, 2018). Across most efforts to implement GPI at the state or regional level, local governments do not have the power to control all GPI indicators, thus decreasing its accuracy and potential for impact (Bagstad & Shammin, 2011). Zencey (2014) has also noted that while the adoption of GPI as a tool to guide development has shifted Vermont away from the traditional "jobs and GDP" approach,

> "...the divergence of the two paths in not yet fully clear to policy makers...No doubt many of the legislators and policy makers who supported the state's adoption of GPI as a better accounting system did not and would not embrace the notion that there are limits to economic growth."

Environment, Sustainability, Opportunity, and Sustainability (ECOS) Project

Background. The Chittenden County Regional Planning Commission initiated the ECOS Project in 2010, which includes an online indicator scorecard as its tool to communicate progress (the "ECOS Scorecard"). ECOS combines the County's comprehensive economic development strategy (CEDS), Metropolitan Transportation Plan, and Enhanced Energy Plan, a significant regional effort led by the Chittenden County Regional Planning Commission (CCRPC) and local business leaders, non-profit partners, and community representatives. The ECOS Scorecard reflects the influence of the Community Indicators Movement, as well as the increasing embrace of new tools to consolidate and communicate complex data through online dashboards. Regional and local efforts beginning in the 1980s to take greater control of community wellbeing measurement led to the formation of “community indicator” projects that sought to “gather and analyze quantitative data to report on indicators that show...trends reflecting the interplay between social, environmental, and economic factors affecting a region’s or community’s well-being” (de Lancer, Broom, & Park, 2017). Community indicator projects can now be found across the U.S. (Blanke & Walzer, 2013).

Political conditions. The ECOS Project resulted from the confluence of several factors. The regional planning commission of Vermont’s most populated and progressive county, CCRPC, had historically played an active role in similarly innovative initiatives. In 1996, CCRPC and other project partners collaborated to develop “the Champlain Initiative,” a multi-sector effort that “proved to be a unique and successful effort to demonstrate how economic security, environmental soundness, and health and well-being all contribute to a healthy, sustainable community” (United Way of Chittenden County, 2012). To expand on the Champlain Initiative, project partners applied for a $999,999 grant from the HUD Sustainable Communities Regional Planning Grant Program, which aimed to support “locally-led collaborative efforts” (Hamshaw, Inwood, Kolodinsky, & Needle, 2017, p. 160). Vermont statute requires regional plans to embrace a wide range of community economic development and natural resource issues, laying the groundwork for the ECOS Plan to guide sustainable and multidimensional development. The ECOS indicator project more specifically was influenced by the Results-Based Accountability Model (RBA) (discussed further in the Outcomes Bill case study), which at the time was being explored by the state legislature and had been implemented already by ECOS partner organizations such as United Way (Chittenden County Regional Planning Commission, 2016).

Purpose. The goal of the ECOS Scorecard is to provide "easy and efficient access" (CCRPC, 2018, p. 52) for ECOS partners and the public to the Scorecard's performance measures. The Scorecard is one of several components that ECOS uses to address plan accountability and monitoring, in addition to annual reports and other tools. Initially, an annual indicator report was planned, though it was only published in 2013 and was replaced by the online Scorecard in 2014. A broader goal of the indicator project can be found in the ECOS Plan's Principle #4 (adapted from Sustainability Goals & Guiding Principles, ICLEI):

> "Redefine progress. Sustainable communities measure progress by improvements in the health and wellbeing of their people, environment and economy. Instead of focusing on GDP (throughput of dollars), local governments in these communities use a broad set of indicators" (CCRPC, 2016).

As a multi-organizational effort, ECOS leaders also valued the "collaborative learning process" of indicator development (Innes & Booher, 2000 in Hamshaw et al., 2018); Innes and Booher argued that such a process was needed to move from the 'traditional annual report' - a concern expressed throughout the wellbeing measurement field (e.g. Durand, 2018). Gahin, Veleva and Hart (2003) describe the benefits of a collaborative indicator development process as empowering community members and increasing shared ownership and buy-in; fostering discussion and awareness about the needs, strengths, and vulnerabilities of the community and specific populations within it;

and ultimately, resulting in positive changemaking. The ECOS indicator project aimed to include these community benefits by engaging local actors (e.g. the regional medical center and the state land-grant university) and the public throughout the process.

Development of indicators. The indicators used in the ECOS Scorecard were chosen in Phase 3 of the project development, with the goal of a shared measurement system for project partners to monitor progress towards goals. In the first round of development, ECOS sub-committees were tasked with identifying potential indicators that: gauged progress toward a desired regional goal; was transparent; drove more than one result; spurred “synergy across indicator categories”; and was actionable (p. 168). The identified indicators were then assessed for their value and availability for Chittenden County specifically. Indicators were kept if they met the project’s criteria for being “valid” (they reflect what it meant to be measured), and “usable” (they can be measured). The indicator development process was also assisted by the Center for Rural Studies, a research organization at the University of Vermont. According to the 2013 ECOS plan report (CCRPC, 2016) a public comment period was opened between February and March of 2012, resulting in 400 comments. Through this refinement process, the original 265 indicators and 39 goal statements were condensed to 80 indicators and 36 goal statements. The indicators are organized by strategy, so that users can easily search through the dashboard. After implementation of ECOS in 2013, the Scorecard has been updated annually with data collected from the U.S. Census Bureau, Vermont state agencies (education, health, and labor), and regional non-profit organizations.

Integration into policy-making. The ECOS Scorecard is monitored and shared through the Annual Reports, which highlight "trends, issues, opportunities and accomplishments". The ECOS Accountability Partnership is charged with tracking partnership efforts towards achieving goals and organizing meetings among partners. The Indicator Technical Committee provides technical support and recommendations to the project. In the first year of reporting, 2014, a 100-page report detailing indicator trends was shared through a press release to little fanfare. The interactive online Scorecard was released in the project's second year; while efforts were again made to bring attention to the Scorecard, "these efforts resulted in little press coverage and limited community outreach" (Hamshaw et al., 2018, p. 170) "Recognizing the challenge of explaining the complex multidimensional ECOS project to the general public," year three of the project saw a renewed outreach effort. Organizers note that the Scorecard faces a couple of limitations more generally. First, most of the data come from secondary sources; the ECOS Scorecard is thus beholden to outside data collectors and has limited control over when or how data is collected or reported. Second, only some indicators have measurable targets and goals resulting in inconsistency in relevancy and accessibility. For instance, the Natural Systems sector of the Scorecard consists of six indicators: two were updated in 2018 and include national standards (particulate matter micrograms per cubic meter and ozone ppm), while the four were last updated between 2008-2012 - some with only one data point and no reference or target information.

Vermont Happiness Index

Background. The Vermont Happiness Index is a statistically significant, state-level survey of subjective wellbeing. The survey tool is based on the Happiness Index, which was developed in 2011 by the U.S.-based Happiness Alliance, a non-profit organization inspired by the wellbeing-focused governance of the Kingdom of Bhutan and the sustainability indicators project of Sustainable Seattle. The Vermont Happiness Index was initiated through coordination between the Center for Rural Studies and Vermont State Data Center at the University of Vermont, Gross National Happiness USA (GNH-USA), and the Happiness Alliance. Indicators of subjective wellbeing - one's self-reported evaluation of life, personal affect, and fulfilment - have been gaining notoriety since the Social Indicators Movement of the 1960s-1970s (Cantril, 1965; Andrews & Withey, 1976; Veenhoven, 2002). Subjective wellbeing indicators are useful complements to objective indicators, since they can provide information that has been traditionally excluded - particularly information regarding subjective concepts, such as "wellbeing" (Eurostat, 2008; Stiglitz et al., 2009; OECD, 2013; United Nations, 2013). This case study differs from the others in that it was not initiated by a government institution but rather is included to specifically examine opportunities that exist for wellbeing measurement outside of government.

Political conditions. The release of the first Vermont Happiness Index in 2013 from the Center for Rural Studies coincided with simultaneous efforts, including the Measuring What Matters Conference in 2012 and the 5th annual Gross National Happiness USA Conference in 2014, both held in Burlington, Vermont. With the Vermont GPI bill recently signed into law, the organizers of the Measuring What Matters

Conference were looking towards next steps, as described by Tom Barefoot, co-founder of GNH-USA, "…identifying the specific elements of well-being that we'll measure, and how these measures can be integrated into public policy." This work was perceived to be in line with legislative interest to build off the GPI, "…to include other aspects of wellbeing that are important to Vermonters" (Tom Barefoot, as quoted in "Dashboard: Vermont Indicators of Well Being," 2012). Around 130 attendees at the 2014 GNH-USA conference continued the discussion of the need to measure wellbeing through a more valid tool than standard indicators of economic performance; attendees included proponents of other alternative measurement initiatives.

The 2013 Vermont Happiness Index gained clout from its reputation as the first representative statewide survey of wellbeing. By the time the second survey was completed in 2017 enthusiasm for alternative indicator systems seems to have waned, as indicated by a decline in news coverage, legislation, conferences, and other public displays of support. Still, a handful of supporters continue to push for public and policy action through GNH-USA, the Vermont-originated national non-profit that helped to launch the Vermont Happiness Index.

Purpose. The Happiness Index was created as an "alternative measure of progress to the frequently used gross domestic product" with the "intent to promote social change" (Musikanski et al., 2017, p. 5-6). The structure of the Happiness Index - open access, broad measures - was specifically developed for an accessible and flexible tool for different users to be able to shape to their needs (Musikanski et al., 2017). GNHUSA, the Vermont State Data Center, and the Center for Rural Studies were able to use and shape the tool for use in Vermont with the purpose of furthering “holistic indicators that balance and enrich standard population indicators” (De Geus & Moser, 2017). The Vermont Happiness Index partners also aim to advance the consideration of wellbeing in policy discussions in Vermont and beyond.

Development of indicators. The Happiness Alliance’s Happiness Index has its roots in Bhutan’s Gross National Happiness Index (GNHI), which measures ten dimensions, or “domains,” of wellbeing including psychological wellbeing, health, time balance, and material wellbeing. The Happiness Index was developed through an iterative, four-round process between 2010-2014 in conjunction with the Personality and Well-Being Lab at San Francisco State University (Muskanski et al., 2017). The indicator questions chosen to measure each domain concept were pulled from existing wellbeing indices. For example, indicators aimed at measuring “satisfaction with life” used questions from the U.K. Office for National Statistics Personal Well-Being. The 2017 Vermont Happiness Index refined the tool further by changing the scale of some questions for clarity and conciseness from 0-10 to 1-5, and removing unnecessary questions altogether.

Integration into policy-making. The survey results have been compiled into two reports published by the Center for Rural Studies. While the survey is still being refined, the Vermont Happiness Index partners see several potential uses for the survey tool and data results; for instance, the survey could be used to compare and contrast specific populations (by geography, ethnicity, etc.) to the larger state population. More broadly, the survey results and survey tool could be used as a formal complement to public decision-making by providing insight on the subjective wellbeing of Vermonters (see for example, the U.K. Measures of National Wellbeing Programme).

As noted above, while the Vermont Happiness Index was developed around the same time as other similar initiatives in the state that were integrated into policy and continues to collect data and garner interest, it has yet to gain significant traction in the state. In contrast to those efforts, the Vermont Happiness Index has not been the focus of a sustained advocacy push, nor of ongoing research (e.g. the GPI) or implementation (e.g. the RBA approach embraced by the Outcomes Bill and the ECOS Plan).

Act 186: "The Outcomes Bill"

Background. Act 186, known as "The Outcomes Bill," was passed by the Vermont legislature in 2014 as a government accountability tool that utilizes an interactive online indicator dashboard to track progress (similar to the ECOS Scorecard). The Outcomes Bill is based on the planning and evaluation model of Results-Based Accountability (RBA), an approach developed by Mark Friedman and field-tested in Vermont in the early 1990s. RBA was adopted by a number of Vermont organizations, with the Vermont Agency of Human Services' then-Secretary Con Hogan leading the way. As far back as 2002, Hogan and his AHS colleague David Murphey describe the rising "outcomes-and-indicators" movement at work in Vermont and imagine new "“barometers" of social well-being" (Hogan & Murphey, 2002, p. 111) analogous to those of economic wellbeing. Results, or outcomes, refer to the "desired conditions of well-being for communities" (Boone, 2014). While this movement was swelling across the country, so too was the pressure for government programs and non-profit organizations to track outcomes as proof of increasing “efficiency, effectiveness and accountability” (de Lancer et al., 2017).

Political conditions. The Outcomes Bill built on previous attempts to establish government accountability programs (Niles, 2014). Sue Zeller, the state’s Chief Performance Officer, attributed the success of Act 186 to collaboration between the Governor’s office, the legislature, and local non-profit organizations: “She said past similar efforts did not have such diverse buy-in from the sectors that conceive and carry out so much of the state’s service work” (Niles, 2014). The RBA model on which the resulting indicator system was based had already been used for a decade by the Vermont Agency of Human Services and large non-profits such as United Way, helping to build familiarity with the concept and proof of its efficacy. These original efforts led to the first Vermont Scorecard, which “tracked the well-being of Vermonters across multiple indicators” (Benchmarks for a Better Vermont, 2014). In 2011, the state received a major federal grant from the Corporation for National and Community Service to establish the Benchmarks for a Better Vermont initiative to train non-profit and government employees within the RBA framework. This work also resulted in the creation of the Vermont Accountability Group “to serve as a clearinghouse for RBA training, news, and events,” which included members involved in other Vermont-based alternative measurement initiatives such as the Vermont State Data Center and GNH-USA (Boone, 2014). In 2013, the joint Government Accountability Committee coordinated with Mark Friedman to present the RBA approach to all Vermont Senate and House members. Legislation was passed in 2014, which benefited from bipartisan support led by Senator

Diane Snelling (R), Representative Anne O'Brien (D), and the Government Accountability Committee. Testimony from the politically progressive People's Budget Campaign shows that while the group believed there was room for improvement, it was "somewhat aligned with the People's Budget campaign goals around accountability" (Haslam & LeBlanc, 2014).

Purpose. The Outcomes Bill was passed to gather data-based information to inform the Vermont legislature of progress toward quality of life outcomes, public expenditure results, and "how to be more effective and accountable to Vermonters" and engage in "better partnership with Vermont communities" (Act 186, 2014). A common framework of performance accountability for state agencies and organizations is established through three questions:

1. How much are we doing?
2. How well are we doing it?
3. And is anyone better off because of it?

Through the transparent measurement of these questions, the law "...establishes an expectation that government programs report performance measures annually that can contribute to a performance-informed budgeting process." Beyond numbers and measurement, the goal is to improve quality of life for Vermonters by informing how well the public sector is doing to achieve wellbeing outcomes (Boone, 2014; Agency of Human Services, 2019).

Development of indicators. Legislators identified 8 population-level wellbeing outcomes to be codified in the statute, including: "Vermont has a prosperous economy";

“Vermonters are healthy”; and “Vermont’s environment is clean and sustainable.” Each outcome is comprised of several indicators; for instance, the clean environment outcome is determined by “percent of water, sewer, and stormwater systems that meet federal and State standards,” “carbon dioxide per capita,” and so on (State of Vermont, 2018). One indicator included in the dashboard is the Genuine Progress Indicator. Issues with and updates to indicators are dealt with by the Agency of Administration in conjunction with the Government Accountability Committee during non-legislative session months, and the Committees of Jurisdiction during the session. State agencies, programs, and non-profits are evaluated based on their ability to demonstrate dedication and progress towards at least one outcome.

Integration into policy-making. The Chief Performance Officer provides an annual Outcomes and Indicator Report of statewide trends to the General Assembly, Government Accountability Committee, and the Joint Fiscal Office. Performance Accountability Liaisons (PALs) help to gather data for the report. In 2018, the reporting format was changed from a written memorandum to an online dashboard and visualization tool (Outcomes Report Scorecard); Zeller noted that this change had not happened sooner due to limited resources (Zeller, 2016).

Individual agencies are meant to track and report indicator data specific to their administrative focus. The Chief Performance Officer Sue Zeller stated in 2014 that in 3-5 years “most of the major programs (will be) able to report on at least a certain number of outcomes and measurements that are tied to their strategic plans and budgets” (Niles, 2014). In 2015, Zeller recommended that all agencies use the Results Scorecard software tool used by AHS to create a standardized statewide reporting format to allow for data sharing with the public, legislators, and between agencies. However, tools for data collection and processing remain unstandardized, if they exist at all: a 2018 review of the Vermont indicator system by the Pew-MacArthur Results First Initiative found that only 10.5% of programs had readily available outcome measures (Pew-MacArthur Results First Initiative, 2018). Still, in 2017 Governor Scott implemented a new initiative called the Program to Improve Vermont Outcomes Together (PIVOT), which added the process framework, Lean, as a complement to RBA; as explained by Zeller, “We might use performance data in a discussion about why we are getting particular results, which could lead to a discussion about which processes need to be streamlined, where we can use Lean,” (Pew, 2018). PIVOT aims to strengthen both frameworks by providing an executive mandate and strategic focus.

Case Study Analysis

The four case studies presented in this article describe Vermont-based wellbeing indicator systems. Applying a general program theory framework, the development and implementation of the indicator systems is examined. While these case studies were chosen based on their representation of different characteristics of wellbeing indicator systems, identified themes show several significant commonalities between them, which may be due to the small, interconnected nature of Vermont as a state. Here we highlight the commonalities and differences among the indicator systems to help learn from these experiences and identify areas for improvement based on international and national best practices in wellbeing measurement.

Implementation in Policy Process

While only two of the case studies (the GPI and Act 186) were developed with explicit policy goals, all four intend to have some impact on decision-making processes. The GPI and Act 186 aim to be included in state budgetary considerations, long-term evaluation of established goals (outcomes), and refinement of programs. The ECOS indicator project more simply tracks community progress towards the established goals of the project and supports collaborative accountability. While the Vermont Happiness Index also was not developed to achieve specific policy goals, its organizers advocate for its use in local, institutional, and state-level decision-making. The Vermont Happiness Index data could be integrated into existing indicator systems in Vermont; for example, the ECOS domain of "social connectedness" includes just one indicator (number of trips provided by the Special Services Transportation Agency) and would be strengthened by including subjective indicator questions from the "social connectedness" domain in the Happiness Index, such as "How satisfied are you with your personal relationships?"

A major theme relates to the influence of RBA, that is the focus on accountability found in the ECOS and Act 186 indicator systems. Interestingly, the move by both initiatives from written reports of indicator trends to an online interactive dashboard to increase accessibility may have put them at risk for *decreasing* accountability. The written reports generally included narratives alongside indicator data points and trends, which seems to have been lost in the move to the online platform; some indicators have retained this information, but it is largely up to the audience to decide what the data means (including what goals should be, why data is missing, if certain trends can be explained, etc.). The Results Scorecard platform used by ECOS and the Outcomes Report provides the functionality for these narratives to be included (e.g. the "story behind the curve" tab) but it is often not used. For instance, in the 2017 Outcomes & Indicators Report (Zeller, 2017) the narrative accompanying the unemployment indicator explains, "The Vermont economy (as is the national economy) is in a period of economic expansion leading to a decline in the unemployment rate," whereas the Outcomes Report Scorecard states, "This long period of economic expansion continued through CY2017. The number of unemployed persons continues to fall."

Fitness for Use

The indicator systems differ in which indicators were chosen, how, and by whom. The Vermont GPI has been a project led primarily by academics (specifically those at the Gund Institute for the Environment and the Center for Rural Studies at the University of Vermont), with the initial framework developed in 1989 by Herman Daly, an economist, and John Cobb, Jr., a theologian. Researchers at the Gund Institute specified indicators within the GPI framework for Vermont with assistance from state administrators and agencies. The Vermont GNH Index followed a similar path; Bhutan's GNH Index, on which the U.S. and Vermont versions were based, was built on the poverty measurement methodology developed by Sabina Alkire and James Foster, of the University of Oxford and George Washington University respectively. ECOS indicators were chosen by project partners through a collaborative process and refined with support from UVM's Center for Rural Studies. The RBA method of Act 186 (and that influenced the ECOS indicators system) was created by Mark Friedman, a former public administrator and founder of the Fiscal Policy Studies Institute. However, Act 186 differs from the other three indicator systems in that it is an overarching framework that allows individual agencies and organizations to choose the indicators most relevant to their work.

Indicators are chosen by their relevance for intended outcomes (i.e., child health) as well as intended audiences, which may also dictate the number of indicators chosen. For instance, the GPI has 25 indicators within three domains, whereas ECOS has over 90 indicators within 17 domains; since the GPI's intended audience are public decision-makers it is important to have a limited number of points to communicate - versus ECOS' purpose of progress tracking for invested partner organizations. Ultimately, the GPI can be aggregated into a single composite indicator that is comparable to GDP, resulting in easier communication and accessibility. However composite indicators risk masking important information and validity issues (OECD, 2008). ECOS and Act 186 use an online "dashboard" approach to indicator systems where domains are displayed separately, allowing users to see trends and changes in different aspects of wellbeing; both utilize an online interactive platform, which indicates ongoing support and funding. The Happiness Index has the potential to be set up as a dashboard, but without the necessary resources remains in the form of a published report.

Moving Wellbeing Forward in Vermont

Interest in more holistic measures of wellbeing has been gaining momentum internationally for several years, though less progress has been made in the United States in terms of applied research and implemented measures. Even more limited studies have looked specifically at state or regional-level wellbeing indicator systems. That said, the wellbeing framework is just one of many similar concepts employed in community development including "sustainability," "quality of life," or more generally "community indicators," so this research identified case studies based on criteria determined by the wellbeing literature. By looking only at self-described wellbeing indices, a complete picture of initiatives aimed at more holistic measurement of social, environmental, and economic progress would be difficult to capture. This study describes the development and extent of policy integration of four wellbeing indicator systems in Vermont, with the goal of helping to build the groundwork for future research and work to further wellbeing indicator systems in Vermont. The case studies have provided preliminary findings illuminating how they fit into a general program theory of wellbeing measurement. The implications of this research are summarized below, along with recommendations for future research. Limitations of this study are also provided.

Implications & Future Research

The focus of this research was to determine whether there are indicator systems at the regional or state level in Vermont that are used to complement traditional economic measures; while the four case studies each presume this goal, there is limited implementation. With relatively limited applied research and U.S. policy initiatives, wellbeing measurement is a ripe area for future research. To move these and similar initiatives forward, we look to the wellbeing literature and established tools.

1. **Definition of framework**. As noted above, each of these case studies employ a different theoretical framework: subjective wellbeing or "happiness" (Vermont Happiness Index), community indicators (ECOS), Results-Based Accountability (Act 186), sustainability/"beyond GDP" (GPI). Still, all these initiatives have

common goals that could perhaps be more efficiently achieved if brought together. A broad wellbeing framework, such as the one as defined by the OECD, does in fact encompass each concept. A unifying program theory would also support implementors of wellbeing measurement programs in public policy.

2. **Stakeholder engagement.** A common theme throughout the literature is the importance of stakeholder engagement (OECD, 2008; Munda, 2015; Barrington-Leigh & Escande, 2018). Of the four case studies, only one solicited significant stakeholder input in the development of indicators and measurement priorities (ECOS). Tommaso et al. (2014) argue that stakeholder engagement during the indicator development process can promote their legitimacy and relevance for policy makers. The two legislative initiatives, GPI and Act 186, benefitted from stakeholder advocates from multiple sectors (e.g. academia, state government, non-profit organizations). Scrivens and Iasiello (2010) identify the importance of *motivating* stakeholders to act; similarly, the European Commission's BRAINPOol project (2013) note the need for the *demand* of new indicator systems, whether from civil society, political leaders, or statisticians and decision-makers. Civil society demand is largely absent in Vermont, except for a handful of dedicated residents.

3. **Integration into policy.** Returning to the concern shared by Durand (2018) and others, this study found that all four case studies do indeed risk turning into "just another report". GPI has been integrated into *other* reports (the Comprehensive Economic Development Strategy and Outcomes Report Scorecard); the Vermont

> Outcomes indicators have been co-opted to some extent by a new framework (LEAN); the Vermont Happiness Index reports have yet to be picked up by decision-makers; and it is similarly unclear how the ECOS Plan is using the collected indicator data to guide action. To address this issue, the involvement of decision-makers in the development of indicator systems (to ensure fitness-for-use) and the coordination between data collection and policy evaluation, priorities, and design is critical.

Future research on wellbeing indicator systems in Vermont and beyond should examine the impact of these initiatives, including unintended consequences; better understanding of impact would allow for evaluation of the "success" of indicator systems. As many of these indicator systems have only been in place for a few years, the time is ripe to begin this analysis. Still, as Exton and Shinwell (2018) point out, establishing causality in public policy can be difficult - especially when dealing with something of a multidimensional nature, such as wellbeing metrics. Conducting interviews with those who have implemented indicator systems (e.g. agency statisticians), those who are expected to use it (e.g. legislators), and those who are expected to benefit from it (e.g. the public) would help to benefit existing and future initiatives. As noted above, a major component missing from the wellbeing indicator landscape in Vermont is broad public demand; in places such as Vermont with highly engaged electorate, public demand is even more critical for the political will to act. Without public understanding and demand for new - and somewhat disruptive - indicator systems of wellbeing, it is unlikely that they will overcome the hurdle of becoming "just another report." These interviews would also help to illuminate the information missing from public communications, for instance, the extent to which bureaucracy or other challenges hinder their implementation. Finally, more in-depth case studies can contribute to the generalized program theory for wellbeing measurement by going beyond theoretical research.

Limitations

The goal of this study was to establish a baseline understanding of the state of wellbeing indicator systems in Vermont. There are several limitations of this study that are mediated by the specific purpose and reach of the study. As a case study report with only four cases, the study is limited by its ability to be generalizable; however program evaluation scholars note that the value of qualitative evaluation research "is not primarily a matter of developing general theories, but of producing project-related, often locally restricted, but scientifically well-founded statement" (Flick, von Kardorff, & Steinke, 2000, p. 140).

This study relied on publicly available information to construct a picture of the wellbeing measurement landscape in Vermont; this was a purposeful choice to retain a narrow focus on and more accessible approach to the research question. However, the information gathered is limited by this method and loses certain nuance and in-depth explanation of the case studies. Conducting interviews and gathering other sources of data would support the research through triangulation. There are also several unanswered questions left by this narrow approach, such as the impact of each indicator system. This study provides a foundation for future research to build off and explore questions related to program impact and success (or lack thereof), broader stakeholder motivation, and future development and refinement of wellbeing indicator systems.

References

Act 186 (2014). General Assembly of the State of Vermont.

Agency of Human Services. (2019). AHS Scorecards. Retrieved November 3, 2019, from https://humanservices.vermont.gov/AHS_performance/copy_of_ahs-scorecards/

Andrews, F. M., & Withey, S. B. (1976). *Social Indicators of Well-Being*. New York: Plenum Press.

Bache, I. (2015). *Evidence, policy and wellbeing* (No. CWiPP Working Paper No.3). Retrieved from www.sheffield.ac.uk/cwipp/working-papers

Bagstad, K. J., & Shammin, R. (2011). Can the Genuine Progress Indicator better inform sustainable regional progress? A case study for Northeast Ohio. *Ecological Indicators*, *18*, 330–341. https://doi.org/10.1016/j.ecolind.2011.11.026

Balestra, C., Boarini, R., & Tosetto, E. (2018). What Matters Most to People? Evidence from the OECD Better Life Index Users' Responses. *Social Indicators Research*, *136*, 907–930. https://doi.org/10.1007/s11205-016-1538-4

Barrington-Leigh, C. P., & Escande, A. (2018). Measuring Progress and Well-Being: A Comparative Review of Indicators. *Social Indicators Research*, *135*, 893–925. https://doi.org/10.1007/s11205-016-1505-0

Blanke, A. S., & Walzer, N. (2013). Community Development Measuring community development: what have we learned? https://doi.org/10.1080/15575330.2013.852595

Bleys, B., & Whitby, A. (2015). Barriers and opportunities for alternative measures of economic welfare. *Ecological Economics*, *117*, 162–172. https://doi.org/10.1016/j.ecolecon.2015.06.021

Boone, H. (2014). *The Outcomes Bill Guide*. *Benchmarks for a Better Vermont*. Brattleboro. Retrieved from https://issuu.com/hillaryboone/docs/the_outcomes_bill-what_it_means_for

Botein, H., & Hetling, A. (2010). Permanent supportive housing for domestic violence victims: program theory and client perspectives. *Housing Policy Debate* , *20*(2), 185–208. https://doi.org/10.1080/10511481003738575

Cantril, H. (1965). *The Pattern of Human Concerns*. New Brunswick: Rutgers Unitversiyt Press.

Chancel, L., Thiry, G., & Demailly, D. (2014). *Beyond GDP indicators: to what end?* Paris, France. Retrieved from www.iddri.org

Chittenden County Regional Planning Commission. (2018). *2018 Chittenden County*

ECOS Plan. Retrieved from www.ecosproject.com/plan

Chittenden County Regional Planning Commission. (2016). 2013 Chittenden County ECOS Plan (as amended 5/18/2016).

Cooksy, L. J., Gill, P., & Kelly, P. A. (2001). The program logic model as an integrative framework for a multimethod evaluation. *Evaluation and Program Planning*, *24*, 119–128. Retrieved from www.elsevier.com/locate/evalprogplan

Coutts, P., & Wallace, J. (2016). *Guidance on Wellbeing Frameworks for Cities and Regions*. Retrieved from https://d1ssu070pg2v9i.cloudfront.net/pex/carnegie_uk_trust/2016/09/Sharpening-our-Focus.pdf

Dashboard: Vermont Indicators of Well Being. (2012). In *Measuring What Matters*. Burlington. Retrieved from http://commongoodvt.org/wp-content/uploads/sites/2/2012/06/DashBoard_GPIPLus_First_Pass_Measuring_What_Matters_20120530.pdf

De Geus, F., & Moser, M. (2017). *2017 Vermont Happiness Study*. Burlington.

de Graaf, J. (2014). Building a Movement for Happiness. Retrieved November 3, 2019, from https://truthout.org/articles/building-a-movement-for-happiness/

de Lancer Julnes, P., Broom, C., & Park, S. (2017). *Can Efforts to Integrate Community Indicators with Performance Measurement Systems Succeed? Lessons from Current Attempts*. Retrieved from http://communityindicators.net/wp-content/uploads/2018/01/Integrating-CI-PM-de-Lancer-Julnes-Broom-Park.pdf

Development, A. of C. and C. (2016). *Vermont 2020 Comprehensive Economic Development Strategy*. Retrieved from https://accd.vermont.gov/sites/accdnew/files/documents/DED/CEDS/CEDS2020FullReport.pdf

Diener, E., Wirtz, D., Biswas-Diener, R., Tov, W., Kim-Prieto, C., Choi, D., & Oishi, S. (2009). New Measures of Well-Being. In E. Diener (Ed.), *Social indicators research series: Vol. 39. Assessing well-being: The collected works of Ed Diener* (pp. 247–266). New York, NY: Springer Science + Business Media. https://doi.org/10.1007/978-90-481-2354-4_12

Durand, M. (2018). Countries' Experiences with Well-being and Happiness Metrics. *Global Happiness Policy Report*, 200–243.

Erickson, J. D., Zencey, E., Burke, M. J., Carlson, S., & Zimmerman, Z. (2013). *Vermont Genuine Progress Indicator 1960-2011: Findings and Recommendations*. Burlington. Retrieved from http://www.ncbi.nlm.nih.gov/books/NBK45443/

Eurostat. (2008). *Feasibility study for Well-Being Indicators, Task 4: Critical review*. Retrieved from https://ec.europa.eu/eurostat/documents/118025/118135/Feasibility_study_Well-Being_Indicators.pdf

Flick, U., von Kardorff, E., & Steinke, I. (2000). *A Companion to Qualitative Research*. London: SAGE Publications Inc.

Fox, M. J. V., & Erickson, J. D. (2018). Genuine Economic Progress in the United States: A Fifty State Study and Comparative Assessment. *Ecological Economics*, *147*(December 2017), 29–35. https://doi.org/10.1016/j.ecolecon.2018.01.002

Gahin, R., Veleva, V., & Hart, M. (2003). Local Environment : The International Communities ? Do Indicators Help Create Sustainable Communities ? *The International Journal of Justice and Sustainability*, *8*(6), 661–666. https://doi.org/10.1080/1354983032000152752

Giannetti, B. F., Agostinho, F., Almeida, C. M. V. B., & Huisingh, D. (2015). A review of limitations of GDP and alternative indices to monitor human wellbeing and to manage eco-system functionality. *Journal of Cleaner Production*, *87*(1), 11–25. https://doi.org/10.1016/j.jclepro.2014.10.051

Hamshaw, K., Inwood, S., Kolodinsky, J., & Needle, M. (2017). The Role of Community Engagement and Indicators in Generating Knowledge for Informing Regional Planning for Sustainability. In *The Routledge Handbook of Community Development* (pp. 159–174). https://doi.org/10.4324/9781315674100-12

Haslam, J., & LeBlanc, N. (2014). *People's Budget Campaign Testimony to Senate Government Operations Committee*. Montpelier, VT.

Hezri, A. A., & Dovers, S. R. (2006). Sustainability indicators, policy and governance: Issues for ecological economics. *Ecological Economics*, *60*, 86–99. https://doi.org/10.1016/j.ecolecon.2005

Hogan, C., & Murphey, D. (2002). *Reframing Responsibility for Well-being Outcomes*. Retrieved from https://www.aecf.org/m/resourcedoc/aecf-OutcomesReframingResponsibilityWellBeing-2002_4.pdf

Initiatvie, P.-M. R. F. (2018). *The Role of Outcome Monitoring in Evidence-Based Policymaking*. Retrieved from https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2018/08/the-role-of-outcome-monitoring-in-evidence-based-policymaking

Leeuw, F. L. (2003). Reconstructing Program Theories: Methods Available and Problems to be Solved. *American Journal of Evaluation*, *24*(1), 5–20. https://doi.org/10.1177/109821400302400102

Legislature, V. Vermont Act 113: An act relating to the genuine progress indicator (2012).

Michaelson, J., Abdallah, S., Steuer, N., Thompson, S., & Marks, N. (2009). *National Accounts of Well-being: Bringing real wealth onto the balance sheet NEF is an independent think-and-do tank that inspires and demonstrates real economic well-being*. London: nef (the new economics foundation). Retrieved from www.nationalaccountsofwellbeing.org

Musikanski, L., Cloutier, S., Bejarano, E., Briggs, D., Colbert, J., Strasser, G., & Russell, S. (2017). Happiness Index Methodology. *Journal of Social Change*, *9*(1), 4–31. https://doi.org/10.5590/JOSC.2017.09.1.02

Newcomer, K. E., Hatry, H. P., & Wholey, J. S. (2015). *Handbook of Practical Program Evaluation* (4th ed.). Hoboken: John Wiley & Sons.

Niles, H. (2014). New state accountability program signed into law. Retrieved November 3, 2019, from https://vtdigger.org/2014/06/11/new-state-accountability-program-signed-law/

OECD. (2008). *Handbook on Constructing Composite Indicators: Methodology and UserGuide*. Retrieved from http://www.oecd.org/sdd/leading-indicators/42495745.pdf

Panebaker, A. (2012). An alternative to the traditional bottom line? Retrieved November 3, 2019, from https://vtdigger.org/2012/05/30/an-alternative-to-the-traditional-bottom-line/

Pollina, A. (2011). Pollina: “Genuine Progress Indicator” would better measure state’s economic growth. Retrieved November 3, 2019, from https://vtdigger.org/2011/08/24/genuine-progress-indicator/

Rogers, P. J., Petrosino, A., Huebner, T. A., & Hacsi, T. A. (2000). Program theory evaluation: Practice, promise, and problems. *New Directions for Evaluation*, *2000*(87), 5–13. https://doi.org/10.1002/ev.1177

Scrivens, K., & Iasiello, B. (2010). *Indicators of “Societal Progress”: Lessons from International Experiences* (No. 33). https://doi.org/10.1787/5km4k7mq49jg-en

State of Vermont. (2018). Current Outcomes and Indicators as of October 30, 2018.

Stiglitz, J. E., Sen, A., & Fitoussi, J.-P. (2009). *Report by the Commission on the Measurement of Economic Performance and Social Progress*. Paris. Retrieved from www.stiglitz-sen-fitoussi.fr

Tommaso, R., Signore, M., Fazio, D., Calza, M. G., & Righi, A. (2014). *Policy use of progress indicators*. *Map on policy use of progress indicators*. Retrieved from http://www.eframeproject.eu/

Trewin, D., & Hall, J. (2004). *Measures of Australia’ s progress - a case study of a national report based on key economic, social and environment indicators*.

United Way of Chittenden County. (2012). Champlain Initiative “closes up shop” after 16 years. Retrieved November 3, 2019, from https://vermontbiz.com/news/june/champlain-initiative-closes-shop-after-16-years

Veenhoven, R. (2002). Why Social Policy Needs Subjective Indicators. *Social Indicators Research*, *58*(1–3), 33–46. Retrieved from https://link-springer-com.ezproxy.uvm.edu/content/pdf/10.1023%2FA%3A1015723614574.pdf

Whitby, A. (2014). *The BRAINPOoL Project: Beyound GDP - From measurement to politics and policy*. Retrieved from www.brainpoolproject.eu

Zeller, S. A. (2016). *2016 Population-Level Outcomes and Indicators Report*. Retrieved from http://www.flaticon.com/.

Zencey, E. (2018). *The 2018 Vermont Genuine Progress Indicator Report*.

CHAPTER 3: WELLBEING IN VERMONT: INSIGHTS FROM THE VERMONT HAPPINESS INDEX

Introduction

Interest in how to more accurately measure human wellbeing and progress has been growing in recent decades. This is in part due to the validation of indicators measuring subjective wellbeing through research and the implementation of "human-centered" policy frameworks in countries such as Bhutan, the small Buddhist kingdom known for its development of "Gross National Happiness." In 2012, the Bhutanese concept was taken to the international stage with the convening of the United Nations' High Level Meeting on Well-Being and Happiness: Defining a New Economic Paradigm. At a time of global economic instability and social unrest, the idea of needing a new measurement of progress was embraced by many country-members; the following year, the United Nations General Assembly formally integrated a "happiness" framework into their economic, social and related work (United Nations, 2013).

This study provides a quantitative analysis of the 2017 Vermont Happiness Index (VHI), a follow up to the 2013 survey – the first statistically representative state-level survey of subjective wellbeing in the United States, according to the Center for Rural Studies (2013). The State of Vermont, as many other states throughout the country, faces major economic, social, and environmental changes. Of concern is the shifting demographics of Vermont's rural agricultural communities. Many Vermont communities struggle with low and stagnant wages (Allen, 2019), caring for an aging population (Smith-Dieng, 2017), and limited employment opportunities (Agency of Commerce and Community Development, 2016). This research seeks to understand what the VHI can tell us about the subjective wellbeing of Vermonters to better inform and evaluate community development strategies and public policies. The specific research questions are as follows:

- R1: What are the main determinants of subjective wellbeing for Vermonters?
- R2: How “happy” are specific Vermont populations?

To answer these questions, first a review of the literature examining the justification and use of subjective wellbeing indicators is presented; second, a description of the methodology and description of metrics chosen for the VHI; third, the main findings from the survey are highlighted; and finally, we conclude with a discussion of the results, limitations of the survey instrument, and recommendations for measurement improvement.

Literature Review

Subjective wellbeing can be understood as "Good mental states, including all of the various evaluations, positive and negative, that people make of their lives and the affective reactions of people to their experiences" (OECD, 2013). This concept encompasses three main categories (OECD, 2013):

- Life evaluation, including the life dimensions leading to overall satisfaction;
- Positive and negative affect, or feelings; and,
- *Eudaimonia*, feelings of meaning or purpose.

Happiness is a term that is often used to describe positive affect, though it can also refer to the "evaluative happiness" that is more specific to life evaluation (United Nations, 2013; Sachs, 2016); in Bhutan, happiness refers to "a collection of values assumed by its creators to be related to a good life, in a moral as well as psychological sense" (Barrington-Leigh & Escande, 2018, p. 913). Thus, while the terms "subjective wellbeing," "happiness," and "life satisfaction" are sometimes used by researchers and policy-makers interchangeably (Bache, Reardon, & Anand, 2016; Helliwell, Layard, & Sachs, 2018), it is important to note that they have distinct definitions, as well as potentially different understandings across cultures (Kroll & Delhey, 2013; Ura et al., 2012; Veenhoven, 2010). For the purposes of this article the term "subjective wellbeing" is used to describe the development and analysis of the Vermont Happiness Survey, as it is a more accurate descriptor of the survey's multidimensional nature.

Limitations of Traditional Indicators

The focus on wellbeing measurement - from the United Nations to Vermont - is a response to the recognition that traditional economic measures do not provide a holistic understanding of human wellbeing. This idea stretches back to the early 1930s as Simon Kuznets, the constructor of the first U.S. national income accounts, warned that "the welfare of a nation can scarcely be inferred from a measurement of national income…" (Kuznets, 1934, p. 7). One critical limitation of economic indicators is that they cannot fully capture human preferences and thus paint an incomplete picture of societal values and wellbeing (Kroll & Delhey, 2013). While economists have historically looked at people’s consumption choices or preferences as a proxy for values and wellbeing, more recent economic research using subjective data has found significant discrepancies between what people value and how they act in real life (Kahneman & Krueger, 2006; Stiglitz, Sen, Fitoussi, 2009; Stutzer & Frey, 2010). Another pitfall in the use of “objective” indicators, which stem from traditional economic indicators (Veenhoven, 2002), is the assumption that they are inherently accurate or unbiased. In fact, objective indicators still involve some subjectiveness in determining which indicators to use, how to weight them, and how to combine them into a composite index (Veenhoven, 2002; Torras, 2008; Kroll & Delhey, 2013). The question of whether GDP or income is an appropriate measure of human happiness or life satisfaction has been the topic of numerous studies. Richard Easterlin (1972, 2013) and others (e.g. Adler & Seligman, 2016; Blanchflower & Oswald, 2004) have found that there are short term positive associations between happiness and income, there is little evidence that greater personal financial satisfaction is associated with more rapid economic growth; further, where income matters for life satisfaction, it is relative - not absolute - income that has an impact. The limitations of current economic measures have real implications: policy, business, and institutional decision-making and evaluation is guided by key indicators, mainly macroeconomic measures such as GDP, which are imprecise at best and detrimental to human and environmental health at worst (European Commission, 2009; Stiglitz et al., 2009; OECD, 2013; United Nations, 2013).

Expanding understanding of wellbeing

Wellbeing research encompasses a broad field of work, of which subjective wellbeing is one component. Consideration and development of subjective wellbeing indicators can be traced back to the origination of social indicators (Veenhoven, 2002); Land & Michalos (2018) describe the development of subjective wellbeing as one major success of the social indicators field, where social indicators are used to measure concepts of happiness and satisfaction with life. During the 1960s, survey research and the Social Indicators Movement boomed in the United States in response to the limitations of traditional indicators discussed above (Cantril, 1965; Andrews & Withey, 1976), as well as a general "reaction against what was perceived as an overemphasis on measures of economic performance as indicative of social wellbeing" (Carley, 1981, p.1). While subjective measures have been used traditionally, such as measuring unemployment through self-reported employment status, subjective measures of wellbeing are distinguished by being uniquely personal measures that cannot be measured by objective indicators. Expanding on the definition of subjective wellbeing provided above, life satisfaction refers to one's self-reported evaluation of their satisfaction with life, either as a whole or within certain domains (i.e. work, the environment). Positive affect is the positive, or hedonic, feelings experienced from moment to moment, and measured in as close to real time as possible; negative affect is similar, replacing positive feelings with the *lack* of positive feelings. Eudaimonia is a concept often translated as "happiness," but is derived from Aristotle's more nuanced description of a "well-lived life" that included feelings of meaning or purpose (United Nations, 2013, p. 4).

Subjective wellbeing indicators can be valuable in several ways. Among wellbeing researchers, there is general agreement on the benefit of including subjective wellbeing indicators as complements to objective indicators, since they can provide traditionally excluded information (Eurostat, 2008; Stiglitz et al., 2009; OECD, 2013; United Nations, 2013) help to "remedy some of their [objective indicators] inherent weaknesses and limitations" (Maridal et al., 2018, p. 5). Recommendation 10 of the renowned Report by the Commission on the Measurement of Economic Performance and Social Progress (Stiglitz et al., 2009) states that a comprehensive understanding of wellbeing requires measures of both objective and subjective wellbeing, as each provide separate and valuable information about people's lives. Subjective input can also help to provide data-driven weights to various aspects of wellbeing, for instance, whether physical health or income is perceived as more important (Kroll & Delhey, 2013). This contribution can counter the potential bias of "top-down" objective indicators - or, "index problem" as termed by Ringen (2006) - in which researchers or public decision-makers choose which variables are important for wellbeing and how to measure them with little to no stakeholder input. Kroll and Delhey (2013) argued that subjective wellbeing indicators are "participatory and empowering" as they expressly value the opinions and knowledge of the community itself and incorporate their voice into the measurement process. Delhey (2004) showed how subjective wellbeing indicators can separate wants from needs, providing additional information regarding the level to which needs are met.

Subjective wellbeing indicators have also been identified as having strong potential to contribute to the adaptive challenges of today's world. Moving away from strictly economic welfare measurements, several government leaders and agencies around the world are using subjective wellbeing indicators to help measure ‘real’ human-centered progress through “...the multidimensionality of wellbeing, which depends on health, education, employment, housing, political involvement, social community, physical environment, and personal and financial security” (Stiglitz et al., 2009). Interest in ‘human-centered’ progress can be found at the international (e.g. OECD Better Life Initiative), national (e.g. Australian Bureau of Statistics), and local levels (e.g. Community Foundations of Canada). National and international agencies are also using subjective wellbeing to build on sustainable development (e.g. the U.K. Department for Environment Food & Rural Affairs; the non-profit organization Redefining Progress; the United Nations Development Programme). The relevance of subjective wellbeing indicators to public policy is being considered by policy makers at all levels, largely due to their ability uncover the determinants of subjective wellbeing, particularly for more vulnerable populations (Bernanke, 2010; Cameron, 2010; Helliwell et al., 2012; OECD, 2015; Stiglitz et al. 2009). More broadly, Durand (2018) and others argue that the use of a wellbeing framework within government can support alignment across agencies. Government programs and outcomes have a direct impact on subjective wellbeing both within and outside of specific agencies, termed “policy spill-overs” (Durand, 2018); by implementing a consistent framework across agencies for the measurement and discussion of wellbeing, decision-makers would be in a better position to avoid negative spill-overs and potentially create a positive effect of greater inter-agency coordination.

Methodology

This study is based on data from the 2017 VHI, a representative state-level survey of subjective wellbeing. The original Happiness Index was developed in 2011 by the U.S.-based Happiness Alliance, a non-profit organization inspired by the wellbeing-focused governance in the Kingdom of Bhutan and the sustainability indicators project of Sustainable Seattle. The VHI, an adaptation of the original tool, was initiated in 2013 through coordination between the Center for Rural Studies at the University of Vermont, the Vermont State Data Center, Gross National Happiness USA (GNHUSA), and the Happiness Alliance. GNHUSA and the Happiness Alliance are non-profit organizations that work to contribute to the dialogue surrounding the best way to change how we measure wellbeing and progress.

Index Development

The Happiness Index was developed through a vetted, iterative process between 2011 and 2015 and modeled after Bhutan's Gross National Happiness Index (Musikanski et al., 2017). Indicators of subjective wellbeing are included in the 2017 VHI, which are grouped around eleven different "domains" of wellbeing (De Geus & Moser, 2017):

- Overall Satisfaction with Life (Satisfaction, happiness, worthwhileness, anxiety)
- Psychological Wellbeing (Engagement, optimism, accomplishment)
- Physical Health (Health, energy, ability, exercise)
- Time Balance (Time for enjoyment, time balance, rushed time)
- Community Vitality (Trust, safety, volunteerism, belonging)
- Social Connectedness (Support, caring, love, loneliness)
- Education and Culture (Cultural opportunity and community culture)
- Physical Environment (Environmental quality and opportunity)
- Governance (Access, trust, confidence)

- Material Wellbeing (Financial security)
- Work Life (Satisfaction, interest, autonomy, pay)

The creation of domains follows Recommendation 8 of the Stiglitz-Sen-Fitoussi Report (2009) which states that, “Surveys should be designed to assess the links between various quality of-life domains for each person, and this information should be used when designing policies.” Because such subjective concepts are difficult to measure outright, these composite domain indicators serve as proxy variables for measuring different aspects of subjective wellbeing. A recent review of wellbeing indices by Adler and Seligman (2016) found that “wellbeing correlates significantly with different domains of life,” (p. 12) and caution that the choices made in the development of the index can cause differences in what the index tells us about wellbeing progress. Domains, or index variables, are thus necessary for understanding the needs in specific areas of wellbeing, as well as providing a more accurate assessment than a single indicator can provide (Singleton & Straits, 2009).

Specific Likert-scale questions within each VHI domain were chosen deliberately and sourced from existing surveys, including the United Kingdom Office for National Statistics (satisfaction with life), Diener and Biswas’ Psychological Well-Being Scale (psychological wellbeing), the European Social Survey (psychological wellbeing), World Health Organization (physical health), U.K. Department of Health (physical health), and Kasser and Sheldon (2009) (time balance). The literature on wellbeing measurement suggests that these domains and their respective indicator variables make up the components, or determinants, of “happiness” (Barrington-Leigh & Escande, 2018). Table 3 below, adapted from Self’s (2017) comparison of wellbeing domains, shows the commonality of domains used by the VHI. For the full list of domain questions, see Appendix A; for a description of question sources, see Musikanski et al. (2017). Cronbach's Alpha, a common estimate of internal consistency for composite indicators (OECD, 2008), confirmed the reliability of the eleven domains employed in the VHI. Cronbach's Alpha estimates ranged from .631 (Environment) to .816 (Psychological Wellbeing).

Table 3. Commonality of wellbeing domains

Vermont Happiness Index	Bhutan Gross National Happiness Index	Measuring UK National Wellbeing	OECD Better Life Index	Canadian Index of Wellbeing	Stiglitz-Sen-Fitoussi Quality of Life Dimensions
Psychological wellbeing	Psychological wellbeing	Personal wellbeing	Life satisfaction		
Social connectedness		Relationships			
Health	Health	Health	Health	Healthy population	Health
Time balance; work life	Time use	What we do	Jobs; work-life balance	Leisure and culture; time use	Personal activities
Community vitality	Community vitality	Where we live	Housing; community; safety	Community vitality	Insecurity
Material wellbeing	Living standards	Personal finance	Income	Living standards	
		Economy			
Education and culture	Education	Education and skills	Education	Education	Education
Governance	Governance	Governance	Governance	Democratic engagement	Political voice
Environment	Ecological diversity and resilience	Natural environment	Environment	Environment	Environmental conditions
	Cultural diversity and resilience				

Survey Delivery

The Vermont State Data Center and UVM's Center for Rural Studies first fielded the VHI in 2013 and replicated the study in July of 2017. Specially trained telephone interviewers utilized a random sample of landline and cellphone numbers. 529 completed responses were collected from respondents 18 years of age or older who lived in Vermont, at a confidence level of 95% and a confidence interval of +/-4% (De Geus & Moser, 2017). Demographic variables collected include gender, age, county, income, and education. Compared to the U.S. Census Bureau's American Community Survey, the study respondent demographics "fell within mostly acceptable margins" (De Geus & Moser, 2017). Indicators were based on 5-point Likert-scale questions, for example: "Please tell me if you: strongly disagree, disagree, neither agree nor disagree, agree or strongly agree with the following statements: In my daily life I seldom have time to do the things I really enjoy."

Testing of Survey Results

Domain (index) variables were calculated to create more accurate representations of each wellbeing concept. As the number of questions within each domain varied, indicator questions were normalized prior to being aggregated into summated Likert scales. The normalized indicators were aggregated for each domain by calculating the arithmetic mean. To run ordinal and binary regressions, domain variables were further grouped by tertiles. This approach allowed the data - instead of the researcher - to define relative categories of low, medium, and high. Bivariate analyses were conducted through crosstabs in SPSS to determine the relationship between demographic variables and specific domains, elucidating the research question "How "happy" are specific Vermont populations?"

Several model specifications added to the robustness and relevance of results (Angrist & Pischke, 2019). To answer the research question, "What are the main determinants of subjective wellbeing for Vermonters," the regressions to gauged which domains had a stronger impact on overall subjective wellbeing, measured through the "satisfaction with life" domain as the dependent variable. The satisfaction with life domain variable is a composite of four five-point Likert scale questions that represent each component of subjective wellbeing (life evaluation, eudaimonia, and positive and negative affect*)*:

1. Overall, how satisfied are you with your life nowadays?
2. To what extent do you feel the things you do in life are worthwhile?
3. Overall, how happy did you feel yesterday?
4. Overall, how anxious did you feel yesterday?

The dependent variable was examined in relation to the various domains of wellbeing listed above, as well as the five demographic variables age, gender, educational attainment, region, and employment. Since one of the domain variables, "material wellbeing," measured financial security, the income demographic variable was left out of the models to reduce redundancy.

The binary logistic regression used the "high" satisfaction with life dummy variable (1=high, 0=other) as the dependent variable, with "medium" and "high" domain dummy variables and dummied demographic variables as the independents. The ordinal probit regression used the tertile satisfaction with life variable (1=high, 2=medium, 3=low) as the dependent variable, with “medium” and “high” domain dummy variables and dummied demographic variables as the independents. A multiple linear regression was also run, as previous studies have found little to no difference between the OLS model and logit/probit models (Bonikowska, Helliwell, Hou, & Schellenberg, 2014; Ferrer-i-Carbonell, 2005; Kubiszewski, Zakariyya, & Costanza, 2018; Maridal et al., 2018; OECD, 2013). The Satisfaction with Life domain variable was the dependent variable, with the wellbeing domain variables and dummied demographics as the independent variables. OLS, the simplest of the three models, can be defined by the equation:

$$\text{Overall Life Satisfaction}_i = \alpha + \beta \text{ Wellbeing Domain}_i + \varepsilon_i$$

Results

Wellbeing by Population

The sample fell within acceptable margins of the Vermont population; however, the sample was better educated (51.5% vs. 34% with a bachelor’s degree or more). The median age for the sample is skewed higher compared with the Vermont population, since it only includes those 18 and older. Table 4 provides a summary of the sample population.

Table 4. Summary of sample population

Demographic Variables	Sample %	VT Population[1] %
Gender (n = 518)		
Male	43.6	50.7
Female	56.4	49.3
Employment (n = 520)		
Employed full or part-time	74.2	
Not employed full or part-time	25.8	
Education (n = 516)		
Less than high school graduate	3.5	8.3
High school graduate or GED	17.6	28.6
Some college or vocational	16.7	21.2
Associates degree or equivalent	10.7	7.9
Bachelor's degree or equivalent	32.2	21.2
Master's degree or higher	19.4	12.8
Age (n = 514)		
18-35	22.8	
36-50	27.6	
51-64	35.8	
65+	13	
Median age		43
Income (n = 452)		
Less than $10,000	5.1	4.9
Between $10,000-$25,000	12.4	16.3
Between $25,000-$50,000	25	22.3
Between $50,000-$75,000	20.6	19.3
Between $75,000-$100,000	15.7	14.2
Over $100,000	21.2	23
Region (n = 529)		
Addison	6.8	5.9
Orleans	3.8	4.3
Rutland	8.5	9.7
Washington	11.2	9.4
Windham	5.5	7
Windsor	7.4	9
Bennington	3.8	5.8
Caledonia	4.5	4.9
Chittenden	25.7	25.5
Essex	0.9	1
Franklin	11.2	7.7
Grand Isle	0.9	1.1
Lamoille	4	4
Orange	5.9	4.6

[1] 2017 American Community Survey

Table 5 reports the descriptive statistics for the eleven wellbeing domain variables. The normalized domain variables scales range from 0-1, with 1 representing the highest level of wellbeing. The domain means range from Governance at .5 to Social Connectedness at .83.

Table 5. Descriptive statistics for wellbeing domain variables

Domain Variables	Variables within domain	Mean	Median	Std. Deviation
Satisfaction with Life	4	0.76	0.81	0.19
Psychological Wellbeing	4	0.77	0.77	0.18
Physical Health	4	0.67	0.69	0.22
Time Balance	3	0.52	0.5	0.21
Community Vitality	7	0.65	0.65	0.18
Social Connectedness	4	0.83	0.88	0.17
Education & Culture	4	0.71	0.71	0.17
Physical Environment	4	0.80	0.81	0.14
Governance	4	0.50	0.5	0.17
Material Wellbeing	4	0.64	0.69	0.25
Work Life	5	0.73	0.73	0.16

[1] n = 529

Figure 3 below shows the total respondents falling across a range of domain values, where blue represents respondents whose answers fell at or below a domain value of .25, orange respondents fell between .25 and .50, grey respondents fell between .50 and .75, and yellow respondents fell between .75 and 1.00.

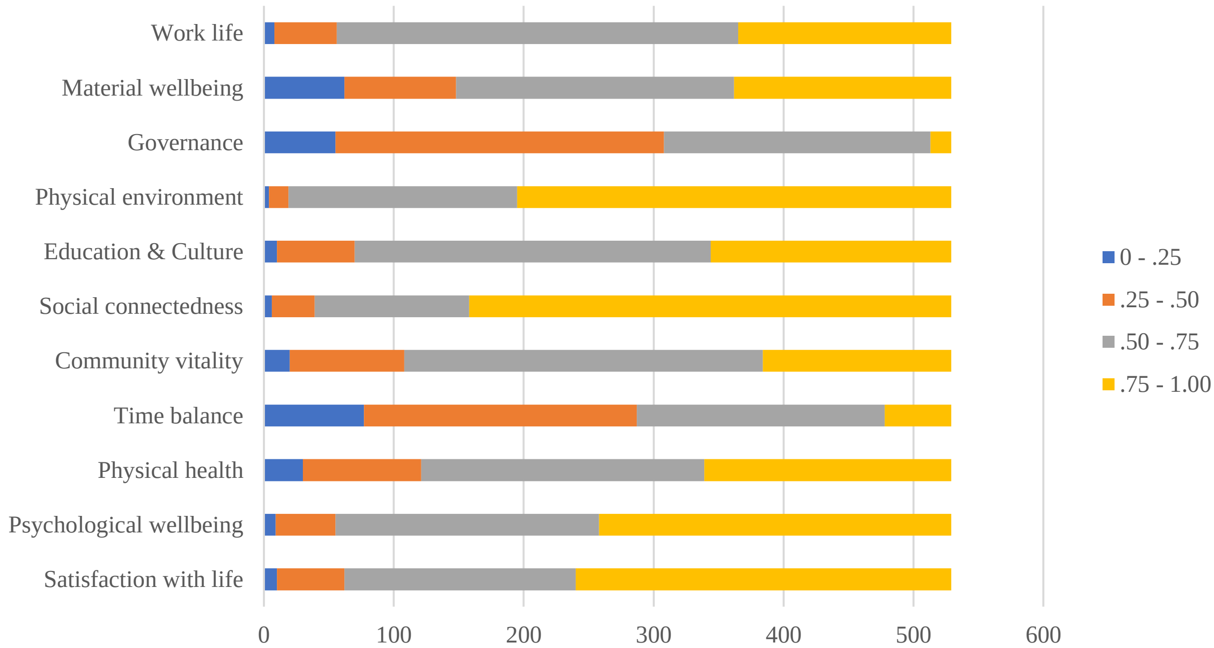

Figure 3. Total respondents within wellbeing domains (n = 529)

Certain wellbeing domains have stronger associations with specific demographic characteristics, shown in Table 6. For instance, Satisfaction with Life is strongly associated with income, where Vermonters with less than $50,000 in income are over twice as likely to have relatively “low” satisfaction with life (47.4%) than those with over $50,000 (21.5%); however, 52.7% of those with over $50,000 in income reported relatively “medium” satisfaction with life, which drops to only 26% reporting high satisfaction with life. Employment, education, and income were the most significantly related demographic variables. Gender was not significant with any domain variables, and region (represented as “Chittenden County” or “Outside Chittenden County”) was only significant for “Education and Culture.” As “Work Life” domain questions were not asked of those without fulltime employment, there is missing data in that section.

Table 6. Wellbeing domains by respondent characteristics

	Gender (n = 518)		Employment (n = 520)		Education (n = 529)		Age (n = 517)		Income (n = 452)		Region (n = 529)	
Domain Variables	Male %	Female	Unemployed (not full or PT)	Employed	Less than bachelor's degree	Bachelor's degree or more	Less than 50 years old	50 years old or older	Less than $50k	$50k or more	Chittenden County	Outside Chittenden County
Satisfaction With Life												
High	20.8	23.6	21.6*	22.8*	18.3**	25.9**	17.7*	27.5*	16.7***	25.8***	22.6	20.6
Medium	44.2	43.8	35.1*	47.2*	41.8**	46.2**	47.0*	41.4*	35.9***	52.7***	45.3	40.4
Low	35	32.5	43.3*	30.1*	39.9**	27.8**	35.3*	31.1*	47.4***	21.5***	32.1	39
Psychological Wellbeing												
High	25.2	26	15.7**	29.3**	20.2**	31.2**	25.2	26.3	17.7***	33.5***	26.2	24.3
Medium	28.3	22.6	24.6**	25.6**	24.7**	26.3**	24.4	25.9	20.8***	25.8***	25.2	26.5
Low	46.5	51.4	59.7**	45.1**	55.1**	42.5**	50.4	47.8	61.5***	40.8***	48.6	49.3
Physical Health												
High	23	24.3	13.4***	27.5***	19.0***	27.8***	22.9	24.7	19.3**	26.9**	22.6	25.7
Medium	40.7	34.9	30.6***	40.2***	32.3***	42.9***	37.2	38.2	34.4**	41.9**	37.4	38.2
Low	36.3	40.8	56.0***	32.4***	48.7***	29.3***	39.8	37.1	46.4**	31.2**	39.9	36
Time Balance												
High	32.7	34.2	46.3***	29.0***	29.7	36.8	29.7	38.2	34.4	31.9	33.8	31.6
Medium	27.4	24.7	29.1***	25.4***	25.9	27.1	25.9	25.9	25	26.2	24.9	30.9
Low	39.8	41.1	24.6***	45.6***	44.5	36.1	44.4	35.9	40.6	41.9	41.2	37.5
Community Vitality												
High	34.5	35.9	22.4**	40.4**	23.6***	47.4***	35.4*	35.7*	26.1***	45.9***	35.8	34.7
Medium	31.6	31.5	36.8**	29.5**	30.5***	32.8***	26.3*	37.0*	29.4***	28.7***	31.2	33.1
Low	34	32.6	40.8**	30.1**	45.9***	19.8***	38.3*	27.3*	44.4***	25.4***	33.1	32.2
Social Connectedness												
High	22.1	26.4	18.7**	26.7**	20.2*	28.6*	24.4	24.7	16.7***	31.2***	25.7	20.6
Medium	38.5	29.5	27.6**	35.2**	33.1*	34.6*	35.3	31.5	30.2***	37.3***	33.3	35.3
Low	39.4	44.2	53.7**	38.1**	46.8*	36.8*	40.2	43.8	53.1***	31.5***	41	44.1
Education & Culture												
High	22.6	21.9	20.9	22.5	15.6**	28.2**	18.0*	26.3*	18.2**	27.3**	18.6***	31.6***
Medium	33.2	33.9	33.6	33.4	34.2**	33.8**	33.1*	34.3*	29.2**	34.2**	31.3***	41.9***
Low	44.2	44.2	45.5	44	50.2**	38.0**	48.9*	39.4*	52.6**	38.5**	50.1***	26.5***
Physical Environment												
High	20.8	27.7	29.1	23.8	20.5**	28.9**	22.9	26.7	20.8**	27.7**	25.2	23.5
Medium	40.3	35.6	30.6	39.6	36.5**	40.2**	36.8	38.6	32.8**	42.3**	38.4	38.2
Low	38.9	36.6	40.3	36.5	43.0**	30.8**	40.2	34.7	46.4**	30.0**	36.4	38.2
Governance												
High	30.5	24.3	25.4	27.7	20.9**	32.7**	24.1	30.7	22.9**	33.1**	25.4	30.9
Medium	35	40.8	35.1	38.9	37.6**	39.5**	40.6	36.3	32.3**	39.2**	38.2	39.7
Low	34.5	34.9	39.6	33.4	41.4**	27.8**	35.3	33.1	44.8**	27.7**	36.4	29.4
Material Wellbeing												
High	35.4	29.1	30.6	32.4	24.0***	39.1***	27.4**	36.7**	15.6***	44.6***	31	33.1
Medium	33.2	30.8	27.6	33.7	30.8***	35.0***	29.7**	34.3**	21.9***	36.9***	33.1	32.4
Low	31.4	40.1	41.8	33.9	45.2***	25.9***	42.9**	29.1**	62.5***	18.5***	35.9	34.6
Work Life												
High	33.2	29.5	-	-	22.4***	39.5***	34.2*	28.7*	19.8***	43.5***	32.1	27.9
Medium	8.8	10.6	-	-	8.7***	10.5***	12.8*	6.8*	12.0***	8.8***	10.2	8.1
Low	58	59.9	-	-	68.8***	50.0***	53.0*	64.5*	68.2***	47.7***	57.8	64

* p <= 0.05
** p <= 0.01
*** p <= 0.001

Regression Results

No demographic variables included in the three model were statistically significant, except for age. This is true even when the dependent variable, satisfaction with life, is tested only with demographic variables. Each of the models (linear, logistic, and ordinal) found six of the domains to be statistically significant: Psychological Wellbeing, Health, Time Balance, Social Connectedness, Material Wellbeing, and Physical Environment. The one exception was that Material Wellbeing was not significant in the logistic regression. These models tell us that those with relatively higher wellbeing within each of these domains were more likely to report higher overall satisfaction with life. The logistic regression found that the model predicted 80.1% of the Satisfaction with Life domain variable. An adjusted R^2 of .527 in the OLS model shows that just over half of the variation in overall Satisfaction with Life can be explained by the ten wellbeing domains and demographic variables. A significant limitation of the models, discussed later, is a possible violation of the assumption that there is no correlation between the explanatory variables. The results of the three models are presented in Tables 7 below.

Table 7. Regression analyses for wellbeing domains predicting Overall Life Satisfaction

	Binary Logistic (n = 512)			Ordinary Least Squares (n = 511)		Ordinal Probit (n = 476)		
Predictor Variables	β	Std. Error	Exp(B)	β	Std. Error	Estimate	Std. Error	Wald
Gender								
Male						0.124	0.116	1.156
Female	0.204	0.263	1.227	0.15	0.012			
Employment Status								
Unemployed						0.112	0.166	0.453
Employed	-0.196	0.392	0.822	0.005	0.016			
Education								
Below Bachelor's Degree						-0.002	0.122	0
Above Bachelor's Degree	-0.026	0.277	0.975	-0.01	0.013			
Age	.02*	0.01	1.02	0.001*	0	-0.01*	0.004	5.499
Region								
Outside Chittenden County						-0.095	0.134	0.507
Chittenden County	-0.07	0.299	0.933	-0.125	0.219			
Psychological Wellbeing				.327***	0.046			
High	1.320***	0.353	3.742			-.666***	0.167	15.969
Medium	0.458	0.345	1.58			-0.219	0.146	2.234
Physical Health				.114**	0.035			
High	1.131**	0.386	3.099			-.633***	0.17	13.932
Medium	.837*	0.351	2.308			-.455**	0.137	10.957
Time Balance				.088**	0.031			
High	.641*	0.315	1.898			-.362*	0.142	6.456
Medium	0.154	0.342	1.166			-0.1	0.143	0.487
Community Vitality				-0.003	0.045			
High	-0.576	0.359	0.562			-0.007	0.163	0.002
Medium	-0.349	0.348	0.705			-0.139	0.15	0.856
Social Connectedness				.263***	0.043			
High	.795*	0.364	2.215			-.673***	0.156	16.609
Medium	.808*	0.333	2.244			-.703***	0.134	27.343
Education & Culture				-0.071	0.041			
High	-0.235	0.341	0.791			0.058	0.164	0.124
Medium	-0.429	0.314	0.651			0.163	0.135	1.466
Physical Environment				.127*	0.053			
High	1.142**	0.379	3.134			-.496**	0.164	9.145
Medium	.894**	0.341	2.446			-.358**	0.137	6.827
Governance				-0.009	0.042			
High	-0.036	0.367	0.964			0.129	0.159	0.655
Medium	0.334	0.332	1.396			0.101	0.139	0.53
Material Wellbeing				.122***	0.028			
High	0.445	0.347	1.56			-.478**	0.157	9.288
Medium	-0.235	0.355	0.791			-0.255	0.144	3.119
Work Life				0.001	0.042			
High	0.284	0.327	1.328			-0.093	0.149	0.388
Medium	-0.671	0.576	0.511			-0.055	0.202	0.073

Note. * p <= 0.05 ** p <= 0.01 *** p <= 0.001. Ordinal Probit estimate shows the reverse sign due to program limitations.

Discussion

Implications of survey results

An increasing number of studies have examined the question of the determinants of wellbeing in recent years using subjective covariates (for recent examples, see: Barrington-Leigh & Wollenberg, 2018; Cavalletti & Corsi, 2018; Kubiszewski et al., 2018). The studies range in geographic area and scale, time span, sample size, and data source. Many use a variation of the life satisfaction question: "In general, how satisfied are you with your life?" While this thesis research was unique in its study area of a small U.S. state, the findings are largely supported by prior studies; critically, the analysis shows that there are multiple factors that impact overall life satisfaction of Vermonters. The regression results indicate that several wellbeing domains are strongly associated with overall satisfaction with life beyond household income; specifically, the 2017 VHI found psychological wellbeing, health, time balance, physical environment, social connectedness, and material wellbeing to be important influencers. This signals that policy directed towards increasing support for mental and physical health, for example, may be an effective use of public dollars. The implications for public policy are significant: as many in the field of wellbeing research have argued, current political and policy focus on income and other economic indicators as comprehensive measures of wellbeing and progress are misled. Further, the findings suggest that policy-makers could effectively improve the wellbeing of Vermonters by focusing on specific aspects of life outside of the economy, such as psychological wellbeing and physical health (Barrington-Leigh & Wollenberg, 2018). As wellbeing research evolves and future longitudinal data can better pinpoint the policy impacts and potential, this study can help to shift the public narrative.

As researchers, municipal and state leaders, businesses and other stakeholders aim to address demographic and economic shifts in Vermont, the VHI can inform this work. Descriptive statistics show several significant differences between various Vermont populations. For instance, only 16% of Vermonters under 50 years old report relatively high satisfaction with Time Balance, compared with over 26% of those over 50. In general, those under 50 had significantly lower Satisfaction with Life (18.3%) compared with those over 50 (28.4%). Income is another factor for satisfaction within specific wellbeing domains: Half of those with less than $50,000 household income (approximately the state median income) reported relatively low satisfaction with Work Life, compared with 38.5% of those over the median household income level.

Limitations

While there are methodological considerations for all statistical evaluations, there are specific concerns related to the use of subjective data. Issues such as differences between perception and reality, cultural differences, and psychological factors are not necessarily limitations, unless they are not addressed adequately during the survey development and interview process (OECD, 2013; Kubiszewski, et al., 2018). Ultimately, subjective measures of wellbeing have been shown to be empirically valid. Oswald and Wu (2010) found objective confirmation of subjective wellbeing measures through a national CDC survey asking a general life satisfaction question. A 2011 study by Lawless and Lucas found predictability in U.S. life satisfaction. Extensive reviews of the literature have determined theoretical and methodological validity (e.g. Adler & Seligman, 2016; Diener, Inglehart, & Tay, 2013).

The Happiness Index underwent years of development and refinement, yet the measurement of subjective well-being is a relatively new field with ongoing contributions to standardization and best practices. For instance, the OECD released the widely respected report *OECD Guidelines on Measuring Subjective Well-Being* in 2013 - two years after the development of the Happiness Index began. Thus, transparency about the human and methodological weaknesses inherent in the selection, reporting and implementation of subjective wellbeing indicators is critical. To increase transparency and evaluate the validity of wellbeing measurement, a precise definition of *what* is being measured is needed. However, what is exactly meant by "happiness" is not provided in the documentation of the Happiness Index methodology (Musikanski et al., 2017); the OECD (2013) addresses this specific concern:

> "The first element of a conceptual framework for the measurement of subjective well-being is to define exactly what is meant...Often, the measurement of subjective well-being is conflated with measuring "happiness"; however, this is both technically incorrect...and misleading…" (p. 29).

The VHI domains have equal weighting; while the weighting of composite indicators is a contentious issue, relying on equal weighting remains a common practice (OECD, 2008; See also, Yang, 2014 for a list of equally weighted indices of "human progress"). There are several pros and cons related to weighting indices or not; as an equally weighted index the Happiness Index is vulnerable to possible double counting where there are two or more highly correlated variables.

The VHI is also limited by simultaneous equation bias. Each of the eleven wellbeing domains are technically dependent variables, yet there is not a large enough sample size to test. As a result, the domains are confounded with other excluded characteristics. Future research could address this limitation by including eleven other objective variables for each domain (e.g. poverty level for material wellbeing, crime rate for community vitality, etc.). Finally, the models used in this study were unable to identify "extra" happiness; that is, in domains such as Community Vitality where there are relatively high levels of wellbeing, the models could not distinguish between the highest levels of happiness.

Future Research & Utilization of the Vermont Happiness Index

The VHI has the potential to be used long-term to track changes in the state population, as well as minority populations within the state that are not accounted for in statewide representative samples such as this one. The importance of employing such indices of wellbeing, particularly over time, is borne out in the literature (Diener, Lucas, Helliwell, & Schimmack, 2009; Barrington-Leigh et al., 2018). However, the "fitness for use" of subjective wellbeing measures and wellbeing indicator systems in general is just as important as the methodological considerations; that is, "even if data are accurate, they cannot be said to be of good quality if they are produced too late to be useful, or cannot be easily accessed, or appear to conflict with other data" (OECD, 2008, p. 44). The VHI would benefit from greater use of participatory methods to engage stakeholders in weighting decisions (OECD, 2008; Munda, 2015; Barrington-Leigh & Escande, 2018). Soliciting community feedback to inform the refinement of the Index could help to strengthen the accuracy of wellbeing domains and could help to develop more specific versions for minority populations to address their needs. New technologies and advancements in measurement and analysis is increasing accessibility and interest in new measures (Nelson et al., 2018); if the VHI is to be used in policy and decision-making as is its creators' intention, such technologies could help to address issues related to timeliness and fitness for use. Finally, for the VHI to be more comparable to other subjective wellbeing indices, further refinement stages could increase alignment - to some extent - with the OECD Guidelines on Measuring Subjective Wellbeing. Future research may also compare the results of the VHI with other common state-level measures such as Gallup Wellbeing and the OECD Regional Wellbeing indices. Vermont has been a state leader in the U.S. in acknowledging the need for alternative measures of wellbeing, having implemented other indicator systems such as the Genuine Progress Indicator; however, none of these measures account for subjective wellbeing. This positions the Vermont Happiness Index, a multi-year, vetted survey instrument to be able to complement existing measures to provide a more holistic account of wellbeing in Vermont.

Conclusion

The subjective wellbeing of individuals is influenced by several factors beyond income. The Happiness Index is one of many tools that have been developed to measure the subjective wellbeing of communities, a critical aspect of overall wellbeing and progress. This research used a self-report survey method to engage Vermont residents in their personal wellbeing. The survey results show that there are specific dimensions of life that are more likely to influence the overall life satisfaction of Vermonters: psychological wellbeing, health, social connectedness, time balance, physical environment, and material wellbeing. Knowledge and understanding of these domains by stakeholders can help to inform work towards supporting Vermont communities. This wellbeing measurement tool can be used at different scales, for example, to assess the wellbeing of minority populations. Future research should examine how to best analyze VHI data in a way that improves its fitness for use.

References

Adler, A., & Seligman, M. E. P. (2016). Using wellbeing for public policy: Theory, measurement, and recommendations. *International Journal of Wellbeing*, *6*(1), 1–35. https://doi.org/10.5502/ijw.v6i1.429

Agency of Commerce & Community Development. (2016). *Vermont 2020 Comprehensive Economic Development Strategy*. Retrieved from https://accd.vermont.gov/sites/accdnew/files/documents/DED/CEDS/CEDS2020FullReport.pdf

Allen, A. W. (2019). Report: Vermont wages are stuck at 2010 levels - VTDigger. Retrieved November 3, 2019, from https://vtdigger.org/2019/01/01/report-vermont-wages-stuck-2010-levels/

Bache, I., Reardon, L., & Anand, P. (2016). Wellbeing as a Wicked Problem: Navigating the Arguments for the Role of Government. *Journal of Happiness Studies*, *17*, 893–912. https://doi.org/10.1007/s10902-015-9623-y

Bernanke, B. S. (2010). The Economics of Happiness. Retrieved from https://www.federalreserve.gov/newsevents/speech/bernanke20100508a.htm

Blanchflower, D. G., & Oswald, A. J. (2004). Well-being over time in Britain and the USA. *Journal of Public Economics*, *88*, 1359–1386. https://doi.org/10.1016/S0047-2727(02)00168-8

Bonikowska, A., Helliwell, J. F., Hou, F., & Schellenberg, G. (2014). *An Assessment of Life Satisfaction Responses on Recent Statistics Canada Surveys*. *Social Indicators Research* (Vol. 118). https://doi.org/10.1007/s11205-013-0437-1

Cameron, D. (2010). PM speech on wellbeing. Retrieved from https://www.gov.uk/government/speeches/pm-speech-on-wellbeing

Carley, M. (1981). *Social Measurement and Social Indicators*. London: Unwin Hyman.

Cavalletti, B., & Corsi, M. (2018). "'Beyond GDP'" Effects on National Subjective Well-Being of OECD Countries. *Social Indicators Research*, *136*, 931–966. https://doi.org/10.1007/s11205-016-1477-0

Delhey, J. (2004). *Life satisfaction in an enlarged Europe*. Dublin. Retrieved from http://www.eurofound.eu.int/publications/files/EF03108EN.pdf

Diener, E., Inglehart, R., & Tay, L. (2013). Theory and Validity of Life Satisfaction Scales. *Social Indicators Research*, *112*, 497–527. https://doi.org/10.1007/s11205-012-0076-y

Diener, E., Lucas, R., Helliwell, J. F., & Schimmack, U. (2009). *Well-being for Public Policy* . Retrieved from https://books.google.com/books?hl=en&lr=&id=k3c9VDD6IPQC&oi=fnd&pg=PR7&dq=Diener,+Lucas,+Schimmack,+%26+Helliwell,+2009&ots=pF9flnQgnO&sig=WGeTrOgvIg1hTGgYuLunj8CdYIQ#v=onepage&q=Diener%2C Lucas%2C Schimmack%2C %26 Helliwell%2C 2009&f=false

Easterlin, R. A. (2013). *Happiness and Economic Growth: The Evidence* (No. Discussion Paper No. 7187). Bonn. Retrieved from http://ftp.iza.org/dp7187.pdf

Ferrer-i-Carbonell, A. (2005). Income and well-being: an empirical analysis of the comparison income effect. *Journal of Public Economics*, *89*, 997–1019. Retrieved from https://ac.els-cdn.com/S004727270400088X/1-s2.0-S004727270400088X-main.pdf?_tid=73a9e49d-a051-4966-8752-58f1c871dc36&acdnat=1552602922_c8ff54947f4aaef9bb39c8cfc87c7e07

Helliwell, J. F., Layard, R., & Sachs, J. D. (2018). *World Happiness Report 2018*.

Kahneman, D., & Krueger, A. B. (2006). *Developments in the Measurement of Subjective Well-Being*. *Journal of Economic Perspectives* (Vol. 20). Retrieved from https://pubs.aeaweb.org/doi/pdfplus/10.1257%2F089533006776526030

Kasser, T., & Sheldon, K. M. (2009). Time affluence as a path toward personal happiness and ethical business practice: Empirical evidence from four studies. *Journal of Business Ethics*, *84*(SUPPL. 2), 243–255. https://doi.org/10.1007/s10551-008-9696-1

Kroll, C., & Delhey, J. (2013). A Happy Nation? Opportunities and Challenges of Using Subjective Indicators in Policymaking. *Social Indicators Research*, *114*, 13–28. https://doi.org/10.1007/s11205-013-0380-1

Kubiszewski, I., Zakariyya, N., & Costanza, R. (2018). Objective and Subjective Indicators of Life Satisfaction in Australia: How Well Do People Perceive What Supports a Good Life? *Ecological Economics, 154*, 361–372. https://doi.org/10.1016/j.ecolecon.2018.08.017

Maridal, J. H., Palich, L., Morgan, G., Gardner, S., McKinney, J., & Bolbocean, C. (2018). Wellbeing Indices: A Comprehensive Inventory of Standards and a Review of Current Comparative Measures. *Ecological Economics*, *149*(February), 1–11. https://doi.org/10.1016/j.ecolecon.2018.02.016

OECD. (2013). *How's Life? 2013: Measuring Well-being*. https://doi.org/http://dx.doi.org/10.1787/9789264201392-en

Ringen, S. (2006). *Reflections on Inequality and Equality* (WZB Discussion Paper No. 201). Berlin. Retrieved from http://www.wzb.eu

Sachs, J. D. (2016). Happiness and sustainable development: Concepts and evidence. In *World Happiness Report*. Retrieved from https://s3.amazonaws.com/happiness-report/2016/HR-V1Ch4_web.pdf

Self, A. (2017). Quality of Life Measurement and Application to Policy: Experiences from the UK Office for National Statistics. *Social Indicators Research*, *130*, 147–160. https://doi.org/10.1007/s11205-015-1140-1

Singleton, R. A., & Straits, B. C. (2009). *Approaches to Social Research* (5th ed.). Oxford University Press.

Smith-Dieng, A. (2017). Angela Smith-Dieng: Aging in Vermont. Retrieved November 3, 2019, from https://vtdigger.org/2017/05/05/angela-smith-dieng-aging-vermont/

Stutzer, A., & Frey, B. (2010). Recent advances in the economics of individual subjective well-being. *Social Research: An International Quarterly*, *77*(4850), 679–714. https://doi.org/10.1353/sor.2010.0055

Torras, M. (2008). The subjectivity inherent in objective measures of well-being. *Journal of Happiness Studies*, *9*(4), 475–487. https://doi.org/10.1007/s10902-007-9084-z

Ura, K., Alkire, S., Zangmo, T., & Wangdi, K. (2012). *An Extensive Analysis of GNH Index. The Centre for Bhutan Studies*.

Veenhoven, R. (2010). Greater Happiness for a Greater Number: Is that Possible and Desirable? *Journal of Happiness Studies*, *11*(5), 605–629. https://doi.org/10.1007/s10902-010-9204-z

Yang, L. (2014). *An Inventory of Composite Measures of Human Progress*. Retrieved from http://hdr.undp.org/sites/default/files/inventory_report_working_paper.pdf

Comprehensive Bibliography

Act 186 (2014). General Assembly of the State of Vermont.

Adler, A., & Seligman, M. E. P. (2016). Using wellbeing for public policy: Theory, measurement, and recommendations. *International Journal of Wellbeing*, *6*(1), 1–35. https://doi.org/10.5502/ijw.v6i1.429

Agency of Commerce & Community Development. (2016). *Vermont 2020 Comprehensive Economic Development Strategy*. Retrieved from https://accd.vermont.gov/sites/accdnew/files/documents/DED/CEDS/CEDS2020FullReport.pdf

Allen, A. W. (2019). Report: Vermont wages are stuck at 2010 levels - VTDigger. Retrieved November 3, 2019, from https://vtdigger.org/2019/01/01/report-vermont-wages-stuck-2010-levels/

Andrews, F. M., & Withey, S. B. (1976). *Social Indicators of Well-Being*. New York: Plenum Press.

Bache, I. (2015). *Evidence, policy and wellbeing* (No. CWiPP Working Paper No.3). Retrieved from www.sheffield.ac.uk/cwipp/working-papers

Bache, I., Reardon, L., & Anand, P. (2016). Wellbeing as a Wicked Problem: Navigating the Arguments for the Role of Government. *Journal of Happiness Studies*, *17*, 893–912. https://doi.org/10.1007/s10902-015-9623-y

Bagstad, K. J., Berik, G., & Brown Gaddis, E. J. (2014). Methodological developments in US state-level Genuine Progress Indicators: Toward GPI 2.0. *Ecological Indicators*, *45*, 474–485. https://doi.org/10.1016/j.ecolind.2014.05.005

Bagstad, K. J., & Shammin, R. (2011). Can the Genuine Progress Indicator better inform sustainable regional progress? A case study for Northeast Ohio. *Ecological Indicators*, *18*, 330–341. https://doi.org/10.1016/j.ecolind.2011.11.026

Balestra, C., Boarini, R., & Tosetto, E. (2018). What Matters Most to People? Evidence from the OECD Better Life Index Users' Responses. *Social Indicators Research*, *136*, 907–930. https://doi.org/10.1007/s11205-016-1538-4

Barrington-Leigh, C. P., & Escande, A. (2018). Measuring Progress and Well-Being: A Comparative Review of Indicators. *Social Indicators Research*, *135*, 893–925. https://doi.org/10.1007/s11205-016-1505-0

Beachy, B., & Zorn, J. (2012). *21st Century GDP: National Indicators for a New Era*. Retrieved from https://web.archive.org/web/20150701192803/https://www.hks.harvard.edu/content/download/67149/1241406/version/1/file/PAE+Beachy_Zorn_2012.pdf

Bernanke, B. S. (2010). The Economics of Happiness. Retrieved from https://www.federalreserve.gov/newsevents/speech/bernanke20100508a.htm

Bishop, M., & Green, M. (2011). We Are What We Measure. *Policy Journal*, *28*(1), 11–15. Retrieved from https://muse.jhu.edu/article/450501

Blanchflower, D. G., & Oswald, A. J. (2004). Well-being over time in Britain and the USA. *Journal of Public Economics*, *88*, 1359–1386. https://doi.org/10.1016/S0047-2727(02)00168-8

Blanke, A. S., & Walzer, N. (2013). Community Development Measuring community development: what have we learned? https://doi.org/10.1080/15575330.2013.852595

Bleys, B., & Whitby, A. (2015). Barriers and opportunities for alternative measures of economic welfare. *Ecological Economics*, *117*, 162–172. https://doi.org/10.1016/j.ecolecon.2015.06.021

Bonikowska, A., Helliwell, J. F., Hou, F., & Schellenberg, G. (2014). *An Assessment of Life*

Satisfaction Responses on Recent Statistics Canada Surveys. *Social Indicators Research* (Vol. 118). https://doi.org/10.1007/s11205-013-0437-1

Boone, H. (2014). *The Outcomes Bill Guide*. *Benchmarks for a Better Vermont*. Brattleboro. Retrieved from https://issuu.com/hillaryboone/docs/the_outcomes_bill-what_it_means_for

Botein, H., & Hetling, A. (2010). Permanent supportive housing for domestic violence victims: program theory and client perspectives. *Housing Policy Debate* , *20*(2), 185–208. https://doi.org/10.1080/10511481003738575

Cameron, D. (2010). PM speech on wellbeing. Retrieved from https://www.gov.uk/government/speeches/pm-speech-on-wellbeing

Cantril, H. (1965). *The Pattern of Human Concerns*. New Brunswick: Rutgers Unitversiyt Press.

Carley, M. (1981). *Social Measurement and Social Indicators*. London: Unwin Hyman.

Cavalletti, B., & Corsi, M. (2018). "'Beyond GDP'" Effects on National Subjective Well-Being of OECD Countries. *Social Indicators Research*, *136*, 931–966. https://doi.org/10.1007/s11205-016-1477-0

Centre for Bhutan Studies & GNH Research. (2016). *A Compass Towards a Just and Harmonious Society: 2015 GNH Survey Report*. Thimphu. Retrieved from www.bhutanstudies.org.bt

Chancel, L., Thiry, G., & Demailly, D. (2014). *Beyond GDP indicators: to what end?* Paris, France. Retrieved from www.iddri.org

Chappell, B. (2019). U.S. Income Inequality Worsens, Widening To A New Gap : NPR. Retrieved November 3, 2019, from https://www.npr.org/2019/09/26/764654623/u-s-income-inequality-worsens-widening-to-a-new-gap

Chittenden County Regional Planning Commission. (2018). *2018 Chittenden County ECOS Plan*. Retrieved from www.ecosproject.com/plan

Chittenden County Regional Planning Commission. (2016). 2013 Chittenden County ECOS Plan (as amended 5/18/2016).

Cooksy, L. J., Gill, P., & Kelly, P. A. (2001). The program logic model as an integrative framework for a multimethod evaluation. *Evaluation and Program Planning*, *24*, 119–128. Retrieved from www.elsevier.com/locate/evalprogplan

Costanza, R., Daly, L., Fioramonti, L., Giovannini, E., Kubiszewski, I., Mortensen, L. F., … Wilkinson, R. (2016). Modelling and measuring sustainable wellbeing in connection with the UN Sustainable Development Goals. *Ecological Economics*, *130*, 350–355. https://doi.org/10.1016/j.ecolecon.2016.07.009

Costanza, R., Hart, M., Posner, S., & Talberth, J. (2009). Beyond GDP : The Need for New Measures of Progress. *Boston University*, (4), 1–47. https://doi.org/0109 970401

Costanza, R., Kubiszewski, I., Giovanni, E., Lovins, H., McGlade, J., Pickett, K. E., … Wilkinson, R. (2014). Time to leave GDP behind. *Nature*, *505*, 283–285. Retrieved from www.asap4all.com

Coutts, P., & Wallace, J. (2016). *Guidance on Wellbeing Frameworks for Cities and Regions*. Retrieved from https://d1ssu070pg2v9i.cloudfront.net/pex/carnegie_uk_trust/2016/09/Sharpening-our-Focus.pdf

Cubasch, U., Wuebbles, D., Chen, D., Cristina Facchini, M., Frame, D., Mahowald, N., & Winther, J.-G. (2013). *Climate Change 2013: The physical science basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge, United Kingdom and New York, NY, USA. Retrieved from http://www.ipcc.ch/pdf/assessment-report/ar5/wg1/WG1AR5_Chapter01_FINAL.pdf

Daly, H., & Cobb Jr, J. (1989). *For the common good : redirecting the economy toward community, the environment, and a sustainable future*.

Dashboard: Vermont Indicators of Well Being. (2012). In *Measuring What Matters*. Burlington. Retrieved from http://commongoodvt.org/wp-content/uploads/sites/2/2012/06/DashBoard_GPIPLus_First_Pass_Measuring_What_Matters_20120530.pdf

De Geus, F., & Moser, M. (2017). *2017 Vermont Happiness Study*. Burlington.

de Graaf, J. (2014). Building a Movement for Happiness. Retrieved November 3, 2019, from https://truthout.org/articles/building-a-movement-for-happiness/

de Lancer Julnes, P., Broom, C., & Park, S. (2017). *Can Efforts to Integrate Community Indicators with Performance Measurement Systems Succeed? Lessons from Current Attempts*. Retrieved from http://communityindicators.net/wp-content/uploads/2018/01/Integrating-CI-PM-de-Lancer-Julnes-Broom-Park.pdf

Delhey, J. (2004). *Life satisfaction in an enlarged Europe*. Dublin. Retrieved from http://www.eurofound.eu.int/publications/files/EF03108EN.pdf

Delhey, J., & Kroll, C. (2012). *Human Happiness and the Pursuit of Maximization:Is More Always Better?* (Research Area Education, Work, and Life Chances, Research Unit Inequality and Social Integration, No. SP I 2012-201). https://doi.org/10.1007/978-94-007-6609-9

DeSilver, D. (2017). U.S. academic achievement lags that of many other countries | Pew Research Center. Retrieved November 2, 2019, from https://www.pewresearch.org/fact-tank/2017/02/15/u-s-students-internationally-math-science/

Diener, E., Inglehart, R., & Tay, L. (2013). Theory and Validity of Life Satisfaction Scales. *Social Indicators Research*, *112*, 497–527. https://doi.org/10.1007/s11205-012-0076-y

Diener, E., Lucas, R., Helliwell, J. F., & Schimmack, U. (2009). *Well-being for Public Policy* . Retrieved from https://books.google.com/books?hl=en&lr=&id=k3c9VDD6IPQC&oi=fnd&pg=PR7&dq=Diener,+Lucas,+Schimmack,+%26+Helliwell,+2009&ots=pF9flnQgnO&sig=WGeTrOgvIg1hTGgYuLunj8CdYIQ#v=onepage&q=Diener%2C Lucas%2C Schimmack%2C %26 Helliwell%2C 2009&f=false

Diener, E., & Suh, E. (1997). Measuring quality of life: Economic, social and subjective indicators. *Social Indicators Research*, *40*(1–2), 189–216. Retrieved from https://link.springer.com/content/pdf/10.1023%2FA%3A1006859511756.pdf

Diener, E., Suh, E. M., Lucas, R. E., & Smith, H. L. (1999). Subjective Well-Being : Three Decades of Progress. *Psychological Bulletin*, *125*(2), 276–302.

Diener, E., Wirtz, D., Biswas-Diener, R., Tov, W., Kim-Prieto, C., Choi, D., & Oishi, S. (2009). New Measures of Well-Being. In E. Diener (Ed.), *Social indicators research series: Vol. 39. Assessing well-being: The collected works of Ed Diener* (pp. 247–266). New York, NY: Springer Science + Business Media. https://doi.org/10.1007/978-90-481-2354-4_12

Durand, M. (2018). Countries' Experiences with Well-being and Happiness Metrics. *Global Happiness Policy Report*, 200–243.

Easterlin, R. A. (1974). Does economic growth improve the human lot? Some empirical evidence. *Nations and Households in Economic Growth*, 89–125. Retrieved from http://graphics8.nytimes.com/images/2008/04/16/business/Easterlin1974.pdf

Easterlin, R. A. (1995). Will raising the incomes of all increase the happiness of all? *Journal of Economic Behavior and Organization*, *27*, 35–47. Retrieved from http://ipidumn.pbworks.com/f/EasterlinIncomesandHappiness.pdf

Easterlin, R. A. (2013). *Happiness and Economic Growth: The Evidence* (No. Discussion Paper No. 7187). Bonn. Retrieved from http://ftp.iza.org/dp7187.pdf

Erickson, J. D., Zencey, E., Burke, M. J., Carlson, S., & Zimmerman, Z. (2013). *Vermont Genuine Progress Indicator 1960-2011: Findings and Recommendations*. Burlington.

Retrieved from http://www.ncbi.nlm.nih.gov/books/NBK45443/
European Commission. (2009). *GDP and beyond: Measuring progress in a changing world*. Brussels.
Eurostat. (2008). *Feasibility study for Well-Being Indicators, Task 4: Critical review*. Retrieved from https://ec.europa.eu/eurostat/documents/118025/118135/Feasibility_study_Well-Being_Indicators.pdf
Exton, C., & Shinwell, M. (2018). *Policy use of well-being metrics: Describing countries' experiences* (OECD Statistics Working Papers). Paris. https://doi.org/10.1787/d98eb8ed-en
Ferrer-i-Carbonell, A. (2005). Income and well-being: an empirical analysis of the comparison income effect. *Journal of Public Economics*, *89*, 997–1019. Retrieved from https://ac.els-cdn.com/S004727270400088X/1-s2.0-S004727270400088X-main.pdf?_tid=73a9e49d-a051-4966-8752-58f1c871dc36&acdnat=1552602922_c8ff54947f4aaef9bb39c8cfc87c7e07
Fioramonti, L. (2013). *Gross Domestic Problem: The Politics Behind the World's Most Powerful Number*. https://doi.org/10.1080/19452829.2014.906214
Flick, U., von Kardorff, E., & Steinke, I. (2000). *A Companion to Qualitative Research*. London: SAGE Publications Inc.
Fox, M. V. (2017). *Designing for Economic Success: A 50-State Analysis of the Genuine Progress Indicator*. University of Vermont.
Fox, M. J. V., & Erickson, J. D. (2018). Genuine Economic Progress in the United States: A Fifty State Study and Comparative Assessment. *Ecological Economics*, *147*(December 2017), 29–35. https://doi.org/10.1016/j.ecolecon.2018.01.002
Gahin, R., Veleva, V., & Hart, M. (2003). Local Environment : The International Communities ? Do Indicators Help Create Sustainable Communities ? *The International Journal of Justice and Sustainability*, *8*(6), 661–666. https://doi.org/10.1080/1354983032000152752
Gasper, D. (2004). *Human Well-Being: Concepts & Conceptualizations*. *The Institute of Social Studies*. https://doi.org/10.1177/002200202236166
Giannetti, B. F., Agostinho, F., Almeida, C. M. V. B., & Huisingh, D. (2015). A review of limitations of GDP and alternative indices to monitor human wellbeing and to manage eco-system functionality. *Journal of Cleaner Production*, *87*(1), 11–25. https://doi.org/10.1016/j.jclepro.2014.10.051
Giovannini, E., & Tommaso, R. (2018). Going beyond GDP: theoretical approaches. In *Handbook of Research on Economic and Social Well-Being* (pp. 1–51). Edward Elgar Publishing.
Hamshaw, K., Inwood, S., Kolodinsky, J., & Needle, M. (2017). The Role of Community Engagement and Indicators in Generating Knowledge for Informing Regional Planning for Sustainability. In *The Routledge Handbook of Community Development* (pp. 159–174). https://doi.org/10.4324/9781315674100-12
Hansen, J. E. (2003). *Can we defuse The Global Warming Time Bomb?* New,York, NY. Retrieved from https://pubs.giss.nasa.gov/docs/2003/2003_Hansen_ha07900q.pdf
Haslam, J., & LeBlanc, N. (2014). *People's Budget Campaign Testimony to Senate Government Operations Committee*. Montpelier, VT.
Helliwell, J. F., Layard, R., & Sachs, J. D. (2018). *World Happiness Report 2018*.
Hezri, A. A., & Dovers, S. R. (2006). Sustainability indicators, policy and governance: Issues for ecological economics. *Ecological Economics*, *60*, 86–99. https://doi.org/10.1016/j.ecolecon.2005
Hogan, C., & Murphey, D. (2002). *Reframing Responsibility for Well-being Outcomes*. Retrieved from https://www.aecf.org/m/resourcedoc/aecf-OutcomesReframingResponsibilityWellBeing-2002_4.pdf
ILO. (2013). Measurement of the Informal Economy. In *The Informal Economy and Decent*

Work: A Policy Resource Guide. Geneva: International Labour Office. Retrieved from https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_policy/documents/publication/wcms_210443.pdf

Initiatvie, P.-M. R. F. (2018). *The Role of Outcome Monitoring in Evidence-Based Policymaking*. Retrieved from https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2018/08/the-role-of-outcome-monitoring-in-evidence-based-policymaking

Kahneman, D., & Krueger, A. B. (2006). *Developments in the Measurement of Subjective Well-Being*. *Journal of Economic Perspectives* (Vol. 20). Retrieved from https://pubs.aeaweb.org/doi/pdfplus/10.1257%2F089533006776526030

Kahneman, D., Krueger, A. B., Schkade, D., Schwarz, N., & Stone, A. (2004). Toward National Well-Being Accounts. *American Economic Review*, *94*(2), 429–434. Retrieved from https://www.jstor.org/stable/pdf/3592923.pdf?refreqid=excelsior%3Aeff886a2e78fdd395dc688e67ddbe91b

Karabell, Z. (2014). *The Leading Indicators: A Short History of the Numbers That Rule Our World*. Retrieved from https://books.google.com/books?id=NtgGBgAAQBAJ&printsec=frontcover&dq=karabel+2014&hl=en&newbks=1&newbks_redir=0&sa=X&ved=2ahUKEwjg-5_u387lAhXCdN8KHV2rA5sQ6AEwAHoECAAQAg#v=onepage&q&f=false

Kasser, T., & Sheldon, K. M. (2009). Time affluence as a path toward personal happiness and ethical business practice: Empirical evidence from four studies. *Journal of Business Ethics*, *84*(SUPPL. 2), 243–255. https://doi.org/10.1007/s10551-008-9696-1

Kroll, C., & Delhey, J. (2013). A Happy Nation? Opportunities and Challenges of Using Subjective Indicators in Policymaking. *Social Indicators Research*, *114*, 13–28. https://doi.org/10.1007/s11205-013-0380-1

Kubiszewski, I., Costanza, R., Franco, C., Lawn, P., Talberth, J., Jackson, T., & Aylmer, C. (2013). Analysis Beyond GDP: Measuring and achieving global genuine progress. *Ecological Economics*, *93*, 57–68. https://doi.org/10.1016/j.ecolecon.2013.04.019

Kubiszewski, I., Zakariyya, N., & Costanza, R. (2018). Objective and Subjective Indicators of Life Satisfaction in Australia: How Well Do People Perceive What Supports a Good Life? *Ecological Economics*, *154*, 361–372. https://doi.org/10.1016/j.ecolecon.2018.08.017

Kuznets, S. (1934). *National Income, 1929-1932*. New York. Retrieved from http://www.nber.org/chapters/c2258.pdf

Land, K. (1983). Social Indicators. *Annual Review of Sociology*, *9*, 1–26. Retrieved from www.annualreviews.org

Land, K. C., & Michalos, A. C. (2018). Fifty Years After the Social Indicators Movement: Has the Promise Been Fulfilled? An Assessment an Agenda for the Future. *Social Indicators Research*, *135*, 835–868. https://doi.org/10.1007/s11205-017-1571-y

Layard, R. (2010). Measuring Subjective Well-Being. *Science*, *327*, 534–535. https://doi.org/10.1126/science.1184703

Leeuw, F. L. (2003). Reconstructing Program Theories: Methods Available and Problems to be Solved. *American Journal of Evaluation*, *24*(1), 5–20. https://doi.org/10.1177/109821400302400102

Legislature, V. Vermont Act 113: An act relating to the genuine progress indicator (2012).

Marcuss, R. D., & Kane, R. E. (2007). *U.S. National Income and Product Statistics: Born of the Great Depression and World War II*. United States . Retrieved from https://apps.bea.gov/scb/pdf/2007/02 February/0207_history_article.pdf

Maridal, J. H., Palich, L., Morgan, G., Gardner, S., McKinney, J., & Bolbocean, C. (2018). Wellbeing Indices: A Comprehensive Inventory of Standards and a Review of Current Comparative Measures. *Ecological Economics*, *149*(February), 1–11.

https://doi.org/10.1016/j.ecolecon.2018.02.016
Max-Neef, M. (1995). Economic growth and quality of life: a threshold hypothesis. *Ecological Economics*, *15*, 115–118. Retrieved from https://ac.els-cdn.com/092180099500064X/1-s2.0-092180099500064X-main.pdf?_tid=c21d2ac1-c279-4f61-9593-4d24af0b4027&acdnat=1536692623_0572b7afb3b518211cc1d51b689c33cc
McNeil Jr., D. G. (2017). A Global Health Scorecard Finds U.S. Lacking - The New York Times. Retrieved November 3, 2019, from https://www.nytimes.com/2017/05/22/health/health-care-global-united-states.html
Meadows, D., Meadows, D., Randers, J., & Behrens III, W. W. (1972). *The Limits to Growth: A Report to The Club of Rome* .
Michaelson, J., Abdallah, S., Steuer, N., Thompson, S., & Marks, N. (2009). *National Accounts of Well-being: Bringing real wealth onto the balance sheet NEF is an independent think-and-do tank that inspires and demonstrates real economic well-being*. London: nef (the new economics foundation). Retrieved from www.nationalaccountsofwellbeing.org
Munda, G. (2015). Beyond GDP: An overview of measurement issues in redefining "wealth." *Journal of Economic Surveys*, *29*(3), 403–422. https://doi.org/10.1111/joes.12057
Musikanski, L., Cloutier, S., Bejarano, E., Briggs, D., Colbert, J., Strasser, G., & Russell, S. (2017). Happiness Index Methodology. *Journal of Social Change*, *9*(1), 4–31. https://doi.org/10.5590/JOSC.2017.09.1.02
Nations, U. (2013). Happiness: towards a holistic approach to development, *20817*(January), 17. https://doi.org/10.1017/CBO9781107415324.004
Nelson, C., Chandra, A., & Miller, C. (2018). Can Measures Change the World? *Stanford Social Innovation*, *16*(1), 42–47. Retrieved from https://search.proquest.com/docview/1967295751/fulltext/E96D6F2D6AA458APQ/1?accountid=28932
Newcomer, K. E., Hatry, H. P., & Wholey, J. S. (2015). *Handbook of Practical Program Evaluation* (4th ed.). Hoboken: John Wiley & Sons.
Niles, H. (2014). New state accountability program signed into law. Retrieved November 3, 2019, from https://vtdigger.org/2014/06/11/new-state-accountability-program-signed-law/
Nordhaus, W., & Tobin, J. (1972). *Is Growth Obsolete?* Retrieved from https://www.nber.org/chapters/c7620.pdf
Nourry, M. (2008). Measuring sustainable development: Some empirical evidence for France from eight alternative indicators. *Ecological Economics*, *67*, 441–456. https://doi.org/10.1016/j.ecolecon.2007.12.019
OECD. (2008). *Handbook on Constructing Composite Indicators: Methodology and UserGuide*. Retrieved from http://www.oecd.org/sdd/leading-indicators/42495745.pdf
OECD. (2011). *Compendium of OECD well-being indicators*. Retrieved from http://www.oecd.org/sdd/47917288.pdf
OECD. (2013). *How's Life? 2013: Measuring Well-being*. https://doi.org/http://dx.doi.org/10.1787/9789264201392-en
OECD. (2014). *How's Life in Your Region?: Measuring regional and local well-being for policy making*.
OECD. (2017). *How's Life? 2017*. OECD. https://doi.org/10.1787/how_life-2017-en
Panebaker, A. (2012). An alternative to the traditional bottom line? Retrieved November 3, 2019, from https://vtdigger.org/2012/05/30/an-alternative-to-the-traditional-bottom-line/
Pollina, A. (2011). Pollina: "Genuine Progress Indicator" would better measure state's economic growth. Retrieved November 3, 2019, from https://vtdigger.org/2011/08/24/genuine-progress-indicator/
Ringen, S. (2006). *Reflections on Inequality and Equality* (WZB Discussion Paper No. 201).

Berlin. Retrieved from http://www.wzb.eu
Rogers, P. J., Petrosino, A., Huebner, T. A., & Hacsi, T. A. (2000). Program theory evaluation: Practice, promise, and problems. *New Directions for Evaluation*, *2000*(87), 5–13. https://doi.org/10.1002/ev.1177
Sachs, J. D. (2016). Happiness and sustainable development: Concepts and evidence. In *World Happiness Report*. Retrieved from https://s3.amazonaws.com/happiness-report/2016/HR-V1Ch4_web.pdf
Scrivens, K., & Iasiello, B. (2010). *Indicators of "Societal Progress": Lessons from International Experiences* (No. 33). https://doi.org/10.1787/5km4k7mq49jg-en
Self, A. (2017). Quality of Life Measurement and Application to Policy: Experiences from the UK Office for National Statistics. *Social Indicators Research*, *130*, 147–160. https://doi.org/10.1007/s11205-015-1140-1
Sen, A. (1983). Development: Which way now? *The Economic Journal*, *93*(372), 745–762. Retrieved from https://www-jstor-org.ezproxy.uvm.edu/stable/pdf/2232744.pdf?refreqid=excelsior%3Ae7c1c72f09c1083026402e551259ad3a
Sen, A. (1990). Development as Capability Expansion. In K. Griffin and J. Knight (Ed.), *Human Development and the International Development Strategy for the 1990s* (pp. 41–54). London: Macmillan. Retrieved from http://morgana.unimore.it/Picchio_Antonella/Sviluppo umano/svilupp umano/Sen development.pdf
Services, A. of H. (2019). AHS Scorecards. Retrieved November 3, 2019, from https://humanservices.vermont.gov/AHS_performance/copy_of_ahs-scorecards/
Singleton, R. A., & Straits, B. C. (2009). *Approaches to Social Research* (5th ed.). Oxford University Press.
Smith-Dieng, A. (2017). Angela Smith-Dieng: Aging in Vermont. Retrieved November 3, 2019, from https://vtdigger.org/2017/05/05/angela-smith-dieng-aging-vermont/
State of Vermont. (2018). Current Outcomes and Indicators as of October 30, 2018.
Stiglitz, J. E., Sen, A., & Fitoussi, J.-P. (2009). *Report by the Commission on the Measurement of Economic Performance and Social Progress*. Paris. Retrieved from www.stiglitz-sen-fitoussi.fr
Stutzer, A., & Frey, B. (2010). Recent advances in the economics of individual subjective well-being. *Social Research: An International Quarterly*, *77*(4850), 679–714. https://doi.org/10.1353/sor.2010.0055
The Library of Economics and Liberty. (n.d.). GDP . Retrieved November 3, 2019, from https://www.econlib.org/library/Topics/College/gdp.html
Tommaso, R., Signore, M., Fazio, D., Calza, M. G., & Righi, A. (2014). *Policy use of progress indicators*. *Map on policy use of progress indicators*. Retrieved from http://www.eframeproject.eu/
Torras, M. (2008). The subjectivity inherent in objective measures of well-being. *Journal of Happiness Studies*, *9*(4), 475–487. https://doi.org/10.1007/s10902-007-9084-z
Trewin, D., & Hall, J. (2004). *Measures of Australia' s progress - a case study of a national report based on key economic, social and environment indicators*.
United Way of Chittenden County. (2012). Champlain Initiative "closes up shop" after 16 years. Retrieved November 3, 2019, from https://vermontbiz.com/news/june/champlain-initiative-closes-shop-after-16-years
U.S. Bureau of Economic Analysis. (2019). Gross Domestic Product. Retrieved November 3, 2019, from https://www.bea.gov/data/gdp/gross-domestic-product
Ura, K., Alkire, S., Zangmo, T., & Wangdi, K. (2012). *An Extensive Analysis of GNH Index*. *The Centre for Bhutan Studies*.

van den Bergh, J. (2009). The GDP paradox. *Journal of Economic Psychology*, *30*(2), 117–135. https://doi.org/10.1016/j.joep.2008.12.001

van den Bergh, J., & Antal, M. (2014). *Evaluating Alternatives to GDP as Measures of Social Welfare/Progress* (No. 56). Retrieved from www.foreurope.eu

Veenhoven, R. (2002). Why Social Policy Needs Subjective Indicators. *Social Indicators Research*, *58*(1–3), 33–46. Retrieved from https://link-springer-com.ezproxy.uvm.edu/content/pdf/10.1023%2FA%3A1015723614574.pdf

Veenhoven, R. (2010). Greater Happiness for a Greater Number: Is that Possible and Desirable? *Journal of Happiness Studies*, *11*(5), 605–629. https://doi.org/10.1007/s10902-010-9204-z

Wallace, J., & Schmuecker, K. (2013). *Shifting the Dial: From wellbeing measures to policy practice*. Retrieved from https://www.ippr.org/files/images/media/files/publication/2012/10/SHIFTING THE DIAL_WEBfinal_9826.pdf

Whitby, A. (2014). *The BRAINPOoL Project: Beyound GDP - From measurement to politics and policy*. Retrieved from www.brainpoolproject.eu

World Bank. (2017). GDP (current US$).

Yang, L. (2014). *An Inventory of Composite Measures of Human Progress*. Retrieved from http://hdr.undp.org/sites/default/files/inventory_report_working_paper.pdf

Zeller, S. A. (2016). *2016 Population-Level Outcomes and Indicators Report*. Retrieved from http://www.flaticon.com/.

Zencey, E. (2018). *The 2018 Vermont Genuine Progress Indicator Report*.

Appendix A: 2017 Vermont Happiness Survey Questions

Domain: Overall Satisfaction with Life

1. Overall, how satisfied are you with your life nowadays?
2. To what extent do you feel the things you do in life are worthwhile?
3. Overall, how happy did you feel yesterday?
4. Overall, how anxious did you feel yesterday?

Domain: Psychological Wellbeing

1. I lead a purposeful and meaningful life.
2. I am engaged and interested in my daily activities.
3. I am optimistic about my future.
4. Most days I feel a sense of accomplishment.

Domain: Physical Health

1. In general, would you say your health is...
2. During the past week, would you say you had a lot of energy...
3. How satisfied were you with your ability to perform daily activities?
4. How satisfied were you with the quality of your exercise?

Domain: Time Balance

1. In a typical week, how much of your time can you spend doing things that you enjoy?
2. In the past week, my life has been too rushed.
3. In the past week, I have had plenty of spare time.

Domain: Community Vitality

1. When thinking about your neighbors, do you trust...
2. When thinking about businesses in your community, do you trust...
3. Now, imagine that you lost a wallet or purse that contained two hundred dollars. How likely would it be to have all your money returned if it was found by someone who lives close by?
4. How satisfied are you with your personal safety in your community?
5. In the past 12 months have you donated money…
6. In the past 12 months have you volunteered your time…
7. Would you describe your feeling of belonging to your local community as...

Domain: Social Connectedness

1. How satisfied are you with your personal relationships?
2. People in my life care about me.
3. During the past week have you felt lonely...
4. During the past week have you felt loved...

Domain: Education & Cultures

1. In your community, how satisfied are you with your access to sports and recreational activities?
2. In your community, how satisfied are you with your access to artistic and cultural activities?
3. In your community, how satisfied are you with your access to learning opportunities like informal seminars or trainings?
4. How often do you feel uncomfortable or out of place in your community because of things like your ethnicity, culture, race, skin color, language, accent, gender, sexual orientation, or religion?

Domain: Physical Environment

1. How healthy is your physical environment?
2. How satisfied are you with efforts to preserve the natural environment in your community?
3. How satisfied are you with opportunities you have to enjoy nature?
4. How satisfied are you with the air quality in your environment?

Domain: Governance

1. Corruption is widespread throughout government in my community.
2. Public officials in my community pay attention to what people think.
3. How much confidence do you have in your Local government?
4. How much confidence do you have in your National government?

Domain: Material Wellbeing

1. In general, how much stress do you feel about your personal finances?
2. How often do you find yourself just getting by financially or living paycheck to paycheck?
3. In the last 12 months, how often have you eaten less because there wasn't enough money for food?
4. I have enough money to buy the things that I want.

Domain: Work Life

1. How satisfied are you with your current work life?
2. How often do you find your current work life interesting?
3. My work conditions allow me to be as productive as I can be.
4. Considering my work efforts and achievements, I get paid appropriately.
5. I am allowed to decide how to get my work done.