International Society for Quality-of-Life Studies

Working Paper Series

Working Paper No. 11

DOI:
https://doi.org/10.5281/zenodo.17432479

Using Subjective Well-being to Track Human Progress in Dashboards

October 2025

Martijn Burger, Sarah Courchesne, Talita Greyling, Kelsey J. O'Connor, Stephanie Rossouw, Francesco Sarracino, & Ruut Veenhoven (*posthumously*)

Using Subjective Well-being to Track Human Progress in Dashboards

Martijn Burger, Sarah Courchesne, Talita Greyling, Kelsey J. O'Connor, Stephanie Rossouw, Francesco Sarracino, & Ruut Veenhoven

Abstract

Gross Domestic Product (GDP) has long been used as a proxy for human progress, despite growing recognition of its limitations. Recently, numerous "beyond GDP" initiatives have emerged, promoting multidimensional dashboards to assess quality of life. However, these often lack a clear headline indicator, limiting their usefulness for policymaking and public communication. This paper argues for placing subjective well-being (SWB) at the center of progress measurement in dashboards. SWB captures the overall impact of life conditions on people's lived experiences and offers a clear, outcome-oriented metric aligned with what truly matters: a good life. We explore how SWB can serve as a headline indicator, complemented by measures of the conditions that support it, to improve policy relevance, accountability, and legitimacy. We also address key measurement challenges and propose ways to overcome them for more effective integration into decision-making frameworks.

Keywords: Beyond GDP, quality of life, measures, subjective well-being

Burger: Erasmus University Rotterdam, Erasmus Happiness Economics Research Organization EHERO. Rotterdam, The Netherlands; Faculty of Management, Open University of the Netherlands, Heerlen, The Netherlands; Faculty of Economics, University of Johannesburg, Johannesburg, South Africa; mburger@ese.eur.nl

Courchesne: Department of Organization, Open Universiteit, Heerlen, Netherlands; ORCID: 0000-0003-1274-9425

Greyling: School of Economics, University of Johannesburg, South Africa; School of Social Sciences and Humanities, Auckland University of Technology, Auckland, New Zealand; ORCID: 0000-0002-3777-7003

O'Connor: STATEC Research, Luxembourg; IZA, Germany; ORCID: 0000-0002-1413-3619

Roussouw: School of Social Science & Public Policy, Auckland University of Technology, New Zealand; School of Economics, University of Johannesburg, Johannesburg, South Africa; ORCID: 0000-0003-3538-9215

Sarracino: STATEC Research, Luxembourg; ORCID: /0000-0002-4073-7037

Veehnoven: Erasmus University Rotterdam, Erasmus Happiness Economics Research Organization EHERO, Rotterdam, The Netherlands; Optentia Research Program, North-West University, Potchefstroom, South Africa; ORCID: 0000-0002-5159-393X

Acknowledgements: This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 101094546. For more information of the project, its partners, and contributors please see WISER website www.wiserhorizons.eu. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or funding partners. Neither the European Union nor the granting authority can be held responsible for them.

1 Introduction: Why Go "Beyond GDP"?

Gross Domestic Product (GDP) was developed explicitly to measure a country's annual production, yet over time, its scope expanded to include human progress (Stiglitz et al., 2018). Numerous groups pushed back over the years as the limitations of GDP as a measure of progress became increasingly evident (Bleys, 2012; Gaukroger, 2023; Stiglitz et al., 2009; Veenhoven, 2002; Layard, 2020). Economists commonly describe economic growth as an expanding pie from which everyone can get a larger slice, satisfy a larger set of needs and desires, and therefore lead longer and happier lives. This view reflects the implicit assumption that economic growth inevitably delivers better lives. However, since the seminal work of Richard Easterlin (1974), this assumption has been challenged (Beja, 2014; Easterlin & O'Connor, 2022). Although GDP growth has the potential to make lives more comfortable, healthier, enjoyable, and environmentally sustainable, in many countries, its negative consequences (inequality, unhealthy lifestyles, loss of social cohesion, pollution, loss of biodiversity and environmental degradation) offset its benefits. If we care about delivering socially and environmentally sustainable lives, then the quality of growth – how we promote and achieve it – matters (Mikucka et al., 2017).

The so-called 'beyond GDP' debate gained steam after the 2008 economic crisis (Fleurbaey, 2009). Particularly influential was the 2009 Stiglitz, Sen, and Fitoussi "Commission on the Measurement of Economic Performance and Social Progress", which recommended "shift[ing] emphasis from measuring economic production to measuring people's well-being" (Stiglitz et al., 2009, p. 12). The OECD followed with its Better Life Initiative (OECD, 2011) and Guidelines for the Measurement of Subjective Well-being (OECD, 2013). Since then, numerous initiatives have emerged to assess quality of life beyond traditional income-based metrics (Jansen et al., 2024). These efforts aim to highlight the facets of life that GDP often overlooks.

Economic growth can be compatible with well-being in countries that promote full employment, social safety nets, protect social capital, and reduce income inequalities. In such countries, economic growth may be slower than what is usually recommended, but better suited to support quality of life. Conversely, if economic growth leads to isolation, stress, inequality, and environmental degradation, then well-being may decline (Mikucka et al., 2017; Sarracino & O'Connor, 2023). This view is not new; for example, the 1996 Human Development Report (Ravallion, 1997) explicitly stated that if economic growth is not properly managed, it can be jobless (without employment growth), voiceless (without improvement in democracy or social inclusion), ruthless (only benefiting the rich), rootless (harming culture and social fabric), and futureless (destroying physical environment), and thus detrimental to human development. Hence, the *quality* of growth is pivotal for well-being (Helliwell, 2008).

Recalling that human progress is more than 'GDP' is one of the main reasons why countries worldwide are working towards integrating new measures of quality of life and well-being in their decision-making process (Mahoney, 2023). At the same time, there is considerable disagreement on how human progress should be measured and which indicators should be included in frameworks. Where economists tend to opt for adjusted GDP measures that correct for externalities, e.g., environmental degradation, other approaches typically rooted in capabilities and human needs theory tend to select a range of indicators that are presented separately or in a composite index. Most national and international initiatives nowadays build on the OECD Better Life framework or the UN Sustainable Development Goals and utilize a multidimensional set of indicators related to well-being, inclusivity and sustainability that are presented in dashboards (Mahoney, 2023; Jansen et al., 2024).

The lack of consensus about which indicators to include, as well as the absence of a headline measure (like GDP), limit the use of such frameworks for policymaking. Dashboards containing multiple indicators enable policymakers to selectively highlight data that supports their agenda (O'Connor, 2023)

and tend to overwhelm users with excessive information, limiting their effectiveness as communication tools, even when key messages are distilled into a few headline indicators (Stiglitz et al., 2009). Indicators are frequently displayed alongside one another without illustrating their interconnections. This leaves policymakers without a clear understanding of the trade-offs, synergies, or causal links between different domains. Consequently, research indicates that dashboards are not designed with measuring progress and decision-making in mind (Seaford, 2013; Exton & Shinwell, 2018). They often lack audience-specific framing and a coherent narrative structure. Most dashboards fall short in illustrating how policy interventions can improve quality of life by enhancing the underlying conditions for a good life, like employment or education. As a result, they also struggle to clarify the trade-offs involved in allocating resources across competing policy priorities.

We build on the work done in the field of well-being economics (Barrington-Leigh & Escande, 2018; Veenhoven, 2019; Barrington-Leigh, 2021; Layard & De Neve, 2023; O'Connor, 2024) to argue in favor of SWB as a single headline indicator to gauge human progress, while still recognizing there is some hesitance towards the use of SWB as a single measure of progress (see e.g., Hayden, 2025). SWB is distinct from other social indicators because it is particularly suitable to capture the overall impact of experiences across different areas of an individual's life (Delhey and Kroll, 2013). According to Layard and De Neve (2023, p. 18), '…*when people advocate wellbeing, they are thinking of it as the ultimate good, with other things being good if they are instrumental in contributing to wellbeing*'. We also make the case for how SWB, in combination with indicators that measure the conditions for a good life, can help to guide better decision-making. Particularly, we argue that we should focus on SWB to gauge progress because it provides a clear outcome measure that focuses on what truly matters to people (a good life), allows governments and organizations to evaluate the real-life impact of policies, and is able to uncover what is needed to realize progress, which further enhances legitimacy. Subsequently, we discuss its measurement along with its limitations and discuss solutions that can be incorporated to overcome these problems.

2 Indicators of Human Progress

2.1 Human progress and the four qualities of life

Human progress can be perceived as the advancement of knowledge and circumstances that improve the quality of life, e.g., spiritual, psychological, societal, economic, technological, cultural, and ecological. At the same time, the discussion on human progress is often misguided by the lack of conceptual clarity on what quality of life entails. Following Veenhoven (2000), it helps to distinguish (1) the *conditions* (or life chances) that enable a good life from the *outcomes* of a good life[1], and (2) the *outer qualities* present in the environment from the *inner qualities* experienced by the individual. The combination of conditions versus outcomes, inner versus outer, leads to four qualities of life that can be summarized with a matrix (see Table 1):

[1] Similar distinctions between opportunities and outcomes are also observed in public health research (Veenhoven, 2000). Health indicators that represent the conditions for good health, such as access to healthcare and proper nutrition, are considered fundamentally different from indicators that measure health outcomes, such as disease prevalence and mortality rates.

Table 1: The four qualities of life

	Outer Qualities	Inner Qualities
Life chances	Livability of the environment	Life-ability of the person
Life outcomes	Utility of life	Appreciation of life

Source: Veenhoven (2000)

The top left quadrant illustrates the environmental factors that contribute to a good life. Social scientists often describe these factors using terms like quality of life, well-being, and environmental livability, whereas economists typically use the term welfare. This encompasses diverse elements such as economic stability, clean air and water, adequate food, education, freedom from discrimination, and safety. Political efforts primarily aim to enhance livability, and as a result, politically driven measures of quality of life tend to focus on livability aspects. Livability can be seen as a prerequisite for SWB.

The top right quadrant represents inner life opportunities, referring to how well-equipped individuals are to handle life's challenges or make the most of their circumstances. This includes physical capabilities, such as good hearing, and mental abilities, such as social intelligence. Human functioning can also be viewed from a developmental perspective, encompassing the acquisition of new life skills, often described as "personal growth" or "self-actualization." The term "art of living" (Veenhoven, 2003) is also relevant here, sometimes implying a higher level of reflection and wisdom, and other times referring to the capacity to enjoy life.

The bottom left quadrant focuses on the external impacts of an individual's life. This involves evaluating the contributions a person makes to areas beyond themselves, such as society, the arts, or science. Moralists often emphasize the effects on others, while environmental activists prioritize minimizing ecological harm. However, living a useful life is not synonymous with living a happy one.

The bottom right quadrant represents the personal outcomes of life, specifically how individuals perceive and value their own lives. This aspect of quality of life is often described using terms like "satisfaction," "subjective well-being," and "happiness."

2.2 GDP as a measure of human progress

Over the past decades, GDP has been the central measure to gauge human progress in societies. Rooted in mainstream economics, GDP per capita was thought to provide a reasonable indication of quality of life since it is connected to consumption possibilities, incluidng necessities for survival at lower levels, and more luxurious goods and services at higher levels. The assumption here is that people will always choose goods within their budget that generate the highest well-being.

This thinking actually involves multiple assumptions: that GDP growth raises everyone's income, that income can buy all factors relevant to quality of life, and that growth does not produce significant negative consequences. Indeed, several issues with using GDP per capita as a measure of quality of life have been acknowledged (Bleys, 2012; Gaukroger, 2023), particularly since the report of Stiglitz et al. (2009). First, GDP does not account for the value of non-market activities like rest and leisure, or non-economic pursuits such as building and nurturing social and community relationships. Products and services that lack a market price are largely excluded from GDP calculations despite having societal value, such as informal care and environmental pollution. This omission can result in either an overestimation or an underestimation of GDP (Robeyns, 2017). Yet, well-being that is obtained through non-market versus market activities can be as important to the quality of life.

Second, GDP per capita is insensitive to the distribution of wealth – it does not tell us anything about how economic gains are distributed in the population. In this regard, economic growth over the past decades has been highly unevenly distributed, with the middle classes in developed nations and people in low-income countries benefiting the least from this growth (Milanovic, 2024).

Third, the creation of well-being through market activities may come at the expense of other factors contributing to well-being. For example, working additional hours to generate a higher GDP per capita may come at the cost of social relationships and leisure time, and the production of some goods and services may come at the cost of job quality, physical and mental health, and the quality of the living environment. For these reasons, GDP per capita should be predominantly considered one of the conditions for a good life and not the outcome of a good life. This was acknowledged early by Adam Smith, who argued that happiness ('inner peace and pleasure') is the ultimate goal in life, and that wealth is a means to reach this goal, not the goal itself (Bruni, 2020).

Despite these warnings and criticisms, GDP per capita remains the main indicator of progress, something that is known as the 'GDP paradox' (Van den Bergh, 2009). There are various reasons for this: it is an internationally harmonized metric, built upon commonly accepted rules, which facilitates comparisons both across and within countries over time. It is also widely used in international institutions, economic models, and policy frameworks, which creates inertia that limits the adoption of alternative measures.

2.3 From GDP to multidimensional dashboards

In 1990, the UN stated that the purpose of progress is to acquire human well-being (United Nations Development Programme, 1990, p. iii), and in 2009, the Commission on the Measurement of Economic Performance and Social Progress (CMEPSP), comprised of 25 social scientists, including six Nobel laureates, recommended "shift[ing] emphasis from measuring economic production to measuring people's well-being" (Stiglitz et al., 2009, p. 12).

Over the years, several schools of thought in economics and the social sciences have criticized the use of GDP to gauge human progress and have come up with their suggestions to better inform policymakers and the general public (Diener & Suh, 1997; Bovenberg & Nicolai, 2024; Jansen et al., 2024). Welfare economists use the concept of utility to understand well-being and prefer the use of monetized values of well-being-affecting components (e.g., cost of inequality and natural depletion) to measure human progress. Capabilities theorists understand progress as the expansion of individuals' *ability* to engage in activities they value (Sen, 2009). The greater the extent to which people in a country can do this, the higher the level of quality of life in that country. Human needs theorists stress that people have physical and psychological needs (e.g., food and shelter, but also connectedness and autonomy) which are required for a fulfilling life (e.g. see Doyal and Gough (1991) and Max-Neef et al. (1991)). SWB scholars such as Layard (2020), Veenhoven (2002), and Easterlin (2019) advocate that progress can be best assessed by examining what people say about how they feel. The key idea is that societies should improve the conditions of a good life that typically contribute to higher levels of SWB. According to this view, measuring human progress can be best done by examining individuals' personal experiences and perceptions of their welfare.

The growing awareness of GDP's limitations and proliferation of various schools of thought led to the development of a plethora of adjusted GDP measures and *composite* measures that account for social and environmental factors. For example, the Genuine Progress Indicator, Measure of Economic Welfare, and Index of Sustainable Economic Welfare provide monetized estimates of quality-of-life based on economic, social and environmental criteria developed by welfare economists. Other scholars have focused on the creation of composite indexes of human progress, such as the Social Progress Index,

which consists of objective indicators related to human needs (Fehder et al., 2018). The best known composite index is probably the Human Development Index (HDI), which was created in the 1990s and inspired by the capability approach (Sen, 1985; Nussbaum, 2000). The HDI covers three dimensions: income, health, and education. By shifting the focus beyond economic growth as the only indicator of progress, the HDI (along with more advanced successors like the Multidimensional Poverty Index) offers a more comprehensive perspective on human progress. Jansen and colleagues (2024) provide a good overview of the different schools of thought, alternative GDP measures and composite indexes.

Although adjusted GDP measures and composite indices present complex information in a condensed way (Clerc et al., 2010), they also have severe limitations. For instance, there is little consensus on how to value items that are not regularly reported in monetary terms (e.g., illegal activities) or how to quantify the costs of natural resource depletion (Costanza et al., 2007). In addition, the choice of which costs are beneficial (added to GDP) and which are detrimental (subtracted from GDP) is subjective. Relatedly, not all of life's conditions are equally measurable (Veenhoven, 2000). The HDI, and its related capability-based indexes, have been criticized for their limited ability to reflect policy changes, experienced quality-of-life improvements and related inequalities. In general, any composite index can be critiqued on the subjectivity required to choose the components and the weights necessary for aggregation to form a single measure (Stiglitz et al., 2009; O'Donnell & Oswald, 2015). Moreover, composite indices are unable to capture the disparity between individual situations (e.g. educated and poor vs. non-educated and rich) and implicitly assume that any loss in one dimension of well-being can be compensated by a gain in another (Mahoney, 2023). In addition, the HDI specifically, also tends to mix up the conditions and the outcomes of a good life by putting life expectancy and its antecedents into one specific index (Veenhoven, 2002).

To overcome these limitations, the seminal Stiglitz-Sen-Fitoussi (2009) report advocated for the use of multidimensional *dashboards* arguing that these would be more informative for policymakers than composite indexes and alternative GDP measures (Jansen et al., 2024). Alongside the growing influence of capabilities theory as a dominant paradigm in informing development policy, dashboards, which can be seen as an extension of the HDI, have become the dominant tool to gauge progress (Cooper et al., 2023). A recent report by the OECD indicates that more than 70% of member States have developed national development frameworks based on a dashboard approach for measuring multidimensional well-being (Mahoney, 2023). Barrington-Leigh and Escande (2018) also observe that frameworks based on dashboards nowadays tend to survive better than those based on composite indices. As outlined by Mahoney (2023), most existing dashboards build on the recommendations in the Stiglitz-Sen-Fitoussi report, the OECD Better Life Framework, UN Sustainable Development Goals, and Eurostat's Quality of Life Framework. Many dashboards then also highlight common determinants of well-being (Mahoney, 2023) related to material living conditions, employment, health, education, leisure, social interactions, economic security and physical safety, governance and basic rights, and the natural environment.

2.4 Limitations of existing dashboard approaches

Current dashboard development suffers from four main problems. First, dashboards are missing a headline indicator. Dashboards often list many separate indicators, which can make it hard for stakeholders to use them to make decisions. While the use of dashboards instead of composite indexes avoids oversimplifying complex ideas like progress or quality of life, complexity also means the dashboard might end up being just a place to store data rather than something that actually changes how people think about progress or helps policymakers to make decisions to improve quality of life (Barrington-Leigh & Escande, 2018). Indeed, as argued by Mahoney (2023), interpreting a dashboard

can be difficult if not all of the indicators are moving in the same direction. In this regard, a headline indicator is needed that lends itself to clear narratives of improvement or decline.

Second, dashboards often fail to distinguish between the conditions and the outcomes of a good life. Assessing conditions alone assumes that an exhaustive list of conditions beneficial to quality of life can be created (Dolan & White, 2007). Conditions and outcomes should also be kept separate so that the outcomes can reveal which conditions matter more or less, improving the interpretability and usability of the dashboard, which is not yet a common practice.

Third and related, dashboards typically lack information on the relative importance of dimensions that are included (Barrington-Leigh & Escande, 2018). As a result, beyond GDP dashboards tend to present domains in isolation (e.g, economy, health, education) rather than capture trade-offs across them. The absence of relative weights in combination with the absence of headline indicators can result in cherry-picking by policymakers to support their narrative (O'Connor, 2024).

Fourth, the relative importance may also vary across countries, contexts (Tov & Nai, 2017), and time. For instance, in low-income countries, concerns about corruption tend to be lower (Tay et al., 2014; Rahman et al., 2021), as individuals prioritize survival and meeting basic needs. However, with economic development comes increased awareness and higher demands for integrity, reflected in greater demand for institutional quality. Similarly, cultural and institutional differences influence how, for example, income inequality, economic decline, and religion are valued (e.g., Li et al., 2019; Arampatzi et al., 2019; Kogan et al., 2013). It is for this reason – differeing weights across countries and time – that the OECD cautions against using its Better Life Index for tracking changes over time.

2.5 Enter SWB

Some scholars have explicitly advocated for placing SWB at the center of national dashboards of progress. The rationale is that SWB can serve both as a headline indicator and as the ultimate outcome measure of what most people value: a happy and fulfilling life. SWB is typically defined as "*the degree to which an individual judges the overall quality of his/her own life-as-a-whole favorably*" (Veenhoven, 1984: 22). This concept captures people's overall evaluations of their lives, encompassing a wide range of economic and non-economic factors. Because it provides a summary measure of what matters most in life from the individual's perspective, many scholars support its use as an indicator of societal progress (e.g., Layard 2000; Veenhoven 2002; and Easterlin 2019).

Support for using subjective measures such as SWB is growing both in academic research and in policymaking (Hayden, 2025). While economists were initially among the most skeptical, this resistance is gradually fading. For instance, Richard Easterlin, Richard Layard, and Ruut Veenhoven have all argued for using SWB, especially life satisfaction, as the primary measure of progress (Easterlin, 2019; Layard, 2020; Veenhoven, 2002). Layard, in particular, contends that commonly used indicators such as income, health, and even freedom are valued because they contribute to a deeper goal: happiness. By contrast, people pursue SWB for its own sake, making it a compelling candidate for a central role in progress measurement.

Nevertheless, some researchers argue that SWB on its own is not sufficient. Barrington-Leigh (2021) and O'Connor (2024) agree that SWB can function as a headline measure and a useful organizing concept for public policy, but should be complemented with additional indicators, especially relating to inequality and environmental sustainability. Costanza et al. (2007) raise questions about how accurately SWB reflects the satisfaction of basic human needs, which is essential for assessing quality of life. Furthermore, Blanchflower and Bryson (2024) point out that life satisfaction, while often used as a proxy for SWB, captures only one dimension of well-being. Other dimensions, such as emotional states or a

sense of meaning, may not align closely with life satisfaction. As such, a broader set of measures to fully capture the concept of well-being is necessary, especially including indicators that reflect the underlying conditions of a good life. A multidimensional approach with SWB as a headline indicator improves the accuracy of progress assessments and increases the relevance of findings for practical decision-making.

From a policy perspective, it is often more feasible to focus on improving the conditions that support well-being—such as economic security, health care, and social relationships—rather than attempting to influence subjective outcomes directly. Even so, SWB measures offer valuable insights. Because they reflect how individuals experience and evaluate their lives, they help identify which conditions matter most. Statistical analyses of SWB data can reveal the relative importance of different life domains and offer guidance on how to make trade-offs between them (Barrington-Leigh & Escande, 2018; Barrington-Leigh, 2021; Cooper et al., 2023). In the next sections, we will further explore how such analyses can inform dashboard design and policy prioritization.

2.6 How SWB can be used as a headline indicator

Many dashboards that measure "Beyond GDP" nowadays include indicators of outcomes such as 'life expectancy' and 'satisfaction'. However, as pointed out by Mahoney (2023), SWB indicators differ in degree of prominence across dashboards. In many national dashboards, SWB is just one of many domains of well-being and is not accorded a particular status or centrality. For instance, the OECD Better Life Index does not include any headline indicators (despite the name). This leaves the status of SWB as an indicator a bit opaque (Barrington-Leigh and Escande, 2018). However, what would a framework with SWB as a headline indicator look like?

Costanza and colleagues (2007) propose one such framework. The authors describe overall quality-of-life as a function of (a) the extent to which each identified human need is satisfied, referred to as "fulfillment," and (b) the significance of the need to the individual or group, determined by its relative impact on their SWB. The outcome of a good life (SWB) can serve as a central indicator[2], as shown in Figure 1.

Generalizing and following the logic of the model in Figure 1, two parameters emerge to guide policymakers:

(1) The state of the conditions for a good life related to the livability of the environment and the life-ability of people in a country, such as the level of GDP per capita, social capital, and resilience. Indicators can be both objective and subjective.

(2) The importance of the different conditions for a good life in terms of their relative contribution to SWB.

SWB summarizes how people fare with their lives in a given region or community and year. The decomposition of SWB into the conditions and their importance would then illuminate what explains the specific result and inform actions for policy. Policymakers also need to clarify which group and context they are focusing on, because what is important for one group may not be important to the same degree for another group. For instance, entrepreneurs may prefer the stimulation of economic growth as the primary policy objective, while others could prioritize environmental sustainability.

[2] Consistent with Barrington-Leigh (2021) and O'Connor (2024).

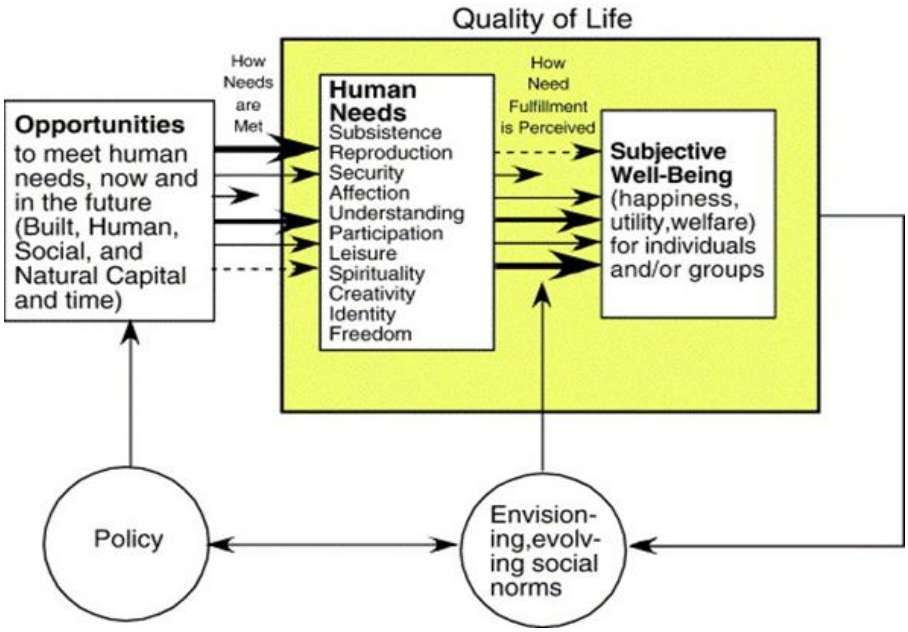

Figure 1: Costanza's Scheme: Quality of Life (QOL) as the interaction of human needs and the subjective perception of their fulfillment, as mediated by the opportunities available to meet the needs. Source: Costanza et al. (2007)

A similar approach is provided by Barrington-Leigh (2021), who suggests using SWB as a headline indicator in its raw form and to use statistical models to assess the relative importance of different conditions for a good life. In other words, SWB can serve both as a standalone indicator and provide a framework for evidence-based weighting and selection of additional indicators within beyond GDP dashboards. Through statistical modeling, SWB can link conditions for a good life to outcomes of a good life, offering a more transparent and reproducible basis for policymaking. Such an approach would enhance accountability and reduce risks of arbitrary judgments in index construction and cherry-picking.

In general, Beyond GDP dashboards have yet to prove their transformational potential. Ensuring true transformational potential requires that indicators not only gain institutional legitimacy but also challenge entrenched policy frameworks. Evidence supporting this concern comes from Malay (2023), who investigated whether Beyond GDP indicators initiated by powerful stakeholders actually provide alternative representations of societal progress. Comparing six prominent indicators, including the previously mentioned HDI, Social Progress Index, Happy Planet Index, and three others, Malay finds that those initiated by actors with institutional influence (e.g., governments, multinational corporations, international organizations) tend to produce country rankings highly correlated with GDP. This strong alignment suggests a low degree of divergence from the growth-centric paradigm, and thus a limited capacity to disrupt prevailing narratives or inspire new policy directions. In contrast, indicators developed by less powerful actors, typically civil society or academic institutions, displayed greater divergence and, by proxy, higher transformational potential. This underscores a central tension in Beyond GDP work: aligning metrics with influential stakeholders may ease adoption but risks conceptual compromise. It is important to develop headline indicators, like SWB, that are easy to communicate and truly reflect values different from GDP.

Various initiatives using SWB as a headline indicator are worth mentioning. For instance, the Eurostat 8+1 framework measures nine key dimensions. The first eight relate to the functional capabilities individuals need to effectively pursue their own SWB, representing the essential conditions for a good life (material living conditions, productive/main activity, health, education, leisure/social interactions,

economic/physical safety, governance/basic rights, and the natural/living environment). The ninth dimension focuses on the actual experience of SWB, reflecting the outcomes of those conditions. Canada treats SWB as a cross-cutting indicator, a complementary summary measure of the overall experienced quality of life. This approach reflects the understanding that different life domains shape overall life satisfaction. The most extensive use of SWB measures in decision making can be found in the United Kingdom (Mahoney, 2023), where the Treasury offers guidance through a Green Book for their civil servants on how to include SWB (in the form of life satisfaction) in cost-benefit analysis to prioritize specific policy alternatives (MacLennan et al., 2021). This approach uses WELLBYs (Layard & Oparina, 2021; Frijters et al., 2024), which are discussed in Section 4.

3 Measurement of SWB[3]

Being able to measure SWB is a precondition for promoting it. The literature has identified various ways to measure people's SWB. Veenhoven (2000) distinguishes two types of SWB based on how they are assessed: evaluative and affective. Evaluative measures of SWB involve people's overall assessments of their lives or specific aspects of it, commonly captured by asking respondents to rate their life satisfaction. This concept presupposes that an individual has developed conscious wants, has formed ideas about their realization, and is able to question whether they are living their life in accordance with them. Affective measures include measures of positive and negative emotions or feelings, such as joy, calm, anger and sadness. They are often combined to form net affect, which is the degree to which positive affective experiences outweigh the negative (also referred to as 'hedonic level of affect' and 'affect balance'). Affect can be assessed over different periods of time – for an hour, a week, or a year, or even a lifetime. Although the cognitive and affective components are typically related, they do not always go hand-in-hand (Knabe et al., 2010): we may feel good most of the time, while being far from getting what we want in life. Similarly, even though we have achieved our goals, we may still feel miserable, as has happened to some famous movie stars.

3.1 Advantages of SWB as headline indicator

When measuring well-defined concepts, objective indicators are often preferred, but for broader concepts like human progress, subjective measures are arguably better (Jahedi & Méndez, 2014). By reflecting people's feelings, values, attitudes, perceptions, and evaluations, subjective measures can account for many otherwise unobservable elements.

Subjective data offer a comprehensive view of well-being (Veenhoven, 2002), making them effective as standalone indicators (Veenhoven, 2002; Diener et al., 2009; Jahedi & Méndez, 2014). In contrast, objective indicators do not reveal which conditions matter or how people value or feel about them and often overlook significant components. For example, household spending may increase due to rising food prices, which might superficially appear as an improvement in living standards, but does not represent true progress. In this example, SWB implicilty captures people's discontent with their living standards and the stress of making ends meet. More broadly, subjective data overcome these challenges and can be used to identify the conditions that affect individual well-being and their context-specific weights (e.g., using bivariate correlations or regression analysis as discussed above).

A further benefit, because individuals, not experts, evaluate their own lives, SWB measures are non-paternalistic. In contrast, the selection of objective indicators often reflects the subjective judgment of experts on what defines a good life (Deaton, 2008). Experts may think they have comprised a comprehensive set of indicators, but nonetheless overlook significant components. As an example,

[3] For overviews on the measurement of SWB, see Veenhoven (2017) and Sirgy (2019).

American women today do not report higher levels of happiness compared to the 1970s, even though many conditions have improved, such as a narrowing wage gap (though not fully closed) (O'Connor, 2017). In fact, women reported lower happiness, both in absolute terms and relative to men. Some researchers attribute this decline to an increase in total working hours, combining workplace and household responsibilities, but the exact reasons remain unknown (Stevenson & Wolfers, 2009). This example highlights how expert-driven (and potentially paternalistic) measures may overlook critical aspects of individuals' well-being.

3.2 Limitations to SWB as headline indicator

SWB indicators are not free from limitations. Here, we can distinguish between conceptual, methodological, and dashboard integration limitations.

Conceptual limitations

When evaluating their lives, people reflect what is important to them and their relatiave value.[4] This is generally regarded as an advantage of self-reported measures but can also be seen as a limitation. A classic critique is that of Sen (1985), who observes that individuals such as destitute beggars, landless laborers, overworked servants, or subjugated housewives may not report low SWB if they have adjusted to their circumstances. Conversely, high achievers might report low well-being due to high expectations.[5] This concern may not be very important however. Happy beggars tend to be quite rare and it is paternalistic to say beggars should be unhappy (consider religious ascetics who live on alms for instance).

Differences in SWB between people are also shaped by factors such as personality and cultural values, the latter of which makes cross-sectional comparisons difficult. Yet, it is unlikely that the experience of SWB differs enormously between peoples (Veenhoven, 2012). For one reason, SWB is largely influenced by a person's affect and mood (Kainulainen et al., 2018), and from an evolutionary perspective, it is hard to imagine that we are dealing with incomparable experiences. Indeed, people share similar concerns. Despite cultural differences, in an open-ended survey across 12 countries, individuals consistently identified living conditions, family, health, personal meaning (character), and work as the most important factors for well-being (Cantril, 1965). Furthermore, progress is fundamentally about change over time, which allows us to focus on the causes of change rather than stable differences between people and countries (e.g., personality and culture).

People in different countries may pursue different concepts of well-being to different degrees, corresponding with their cultural values, for instance, interdependent well-being in collectivist versus individual well-being in individualistic societies (Hitokoto & Uchida, 2015; Lambert et al., 2020; Burger & Pang, 2025). Additionally, the relative importance of evaluative and affective components of SWB may differ across cultures. Dashboards have generally prioritized life satisfaction, but this preference has been based on both data availability and the fact that most frameworks have been developed in Western contexts.

Methodological limitations

Apart from conceptual limitations, there are also several methodological limitations. First, answers in surveys can be sensitive to variations in the method of questioning, such as preceding questions, phrasing of response options, characteristics of the interviewer, weather, and so on. Some concerns seem

[4] Yet, there is no agreement whether life evaluation can be regarded as a weighted average of domain satisfactions, see e.g., the discussion by Rojas (2006).

[5] Graham and Pettinato (2002) distinguish the two groups as "happy peasants" and "frustrated achievers."

to be larger than others – question-wording effects are likely small (Hendriks et al., 2025), while survey (Prati & Beuchot, 2025) and context (Deaton, 2012) effects can be large. In either case, appropriate use of survey methodology can limit these concerns, such as large samples spread across sufficient periods of time, and attention to question ordering and survey effects.

Evaluating changes in SWB over time presents its own set of challenges. As individuals adjust their expectations or become accustomed to improved living conditions, these advancements may no longer increase SWB (Fabian, 2022; Van Praag & Ferrer-i-Carbonell, 2010). In essence, progress may occur but it may not be reflected in SWB as indivdiuals adapt. This is one reason why SWB should be a headline indicator in a dashboard of indicators (additional indicators can be used to better understand adaptation and inform subsequent decision making). Moreover, adaptation is not complete, because if it were, SWB would not change over time, when in reality, we observe various long-term trajectories of SWB both within and across countries (Mikucka et al., 2017, O'Connor 2017, Easterlin and O'Connor 2022).

Recently, there has been renewed discussion in wellbeing economics around the fact that SWB is often treated cardinally (Schröder & Yitzhaki, 2017; Bond & Lang, 2019) – given SWB is measured on an ordinal scale, standard regression coefficients may be incorrect due to differences in how the scales are used. A good discussion of this problem is provided by Kaiser and Vendrik (2023), see also Ng (1997). Arising from this concern, policies based on mean SWB scores may favor the wrong group or policy and gains in well-being found in policy evaluations may be statistical illusions. An important implication of the problem is that SWB research needs to move beyond averages, towards more distributional analysis. Additional diagnostics and tools specifically intended to respond to Schröder & Yitzhaki (2017) and Bond & Lang (2019) have also been developed (Chen et al., 2019; Kaiser & Lepinteur 2025).

SWB faces two other limitations. First, as SWB is typically measured on a bounded scale, it cannot increase forever, unlike GDP, for instance. For this reason too, as with adaptation, it is important that SWB is accompanied by additional indicators. Nonetheless, in practice there is scope and precedent for positive change over a significant period of time (as mentioned above). Second, individuals may choose to respond strategically to surveys to influence reported SWB, thereby affecting political outcomes (Frey and Stutzer, 2010). However, we do not have evidence of this, and it could be mitigated by targeting the conditions of a good life rather than the outcome directly.

Dashboard Integration limitation

Finally, there are several limitations to integrating SWB in dashboards as a headline indicator. First, SWB does not necessarily capture two dimensions that are often deemed important in the SWB framework: sustainability and inclusion. Similar to GDP, SWB improvements can be futureless – destroying the physical environment and SWB of future generations – and very unequally distributed. This issue merits the inclusion of additional indicators that account for inclusion and sustainability.

Second, SWB data is not always readily available, as most of this data is still collected through surveys. It may also take years for policies to affect SWB as it is the ultimate distal outcome (i.e., a long-term, general indicator). Policymakers and voters often seek short-term feedback, while measures like SWB typically change slowly over time and are influenced by multiple long-term factors. Two solutions address this issue. First, policy evaluation can focus more on proximate outcomes in the form of life conditions. For example, labor market reforms might first affect proximate outcomes like the unemployment rate before they affect overall life satisfaction. Such proximate outcome measures are often the first to react to policy mandates and may precede overall SWB outcomes (see also the framework by Costanza provided above). This would also help to overcome, in part, the attribution

problem, which is caused by the fact that SWB is influenced by many overlapping and interrelated factors, which makes linking changes in SWB to specific policies difficult. Second, SWB data can be collected in different ways, e.g., through Big Data and machine learning, which will be discussed in the next section.

Third, SWB is a metric that often fails to capture the imagination of policymakers (Battaglia 2022), which hampers its practical implementation. While policymakers generally understand the concept of SWB (more than composite indexes), its use challenges many of the assumptions and routines embedded in traditional policy evaluation. In particular, policymakers are trained to work with and trust objective, cardinal indicators, especially those expressed in monetary terms. In this context, it would be helpful to incorporate complementary metrics that better align with the language and mindset of policymakers, as will be discussed in Section 4. At the same time, SWB often runs counter to dominant economic logic, which can be uncomfortable for technocratic systems. For example, SWB may not improve despite clear objective gains in GDP or employment rate, and it is not directly actionable in itself since only its antecedents can really be targeted by policy. This calls for a different mode of thinking by policymakers, one that requires deliberate training and adjustment.

4 Advancing SWB for Policy Use

In the final section, we discuss complementary metrics for enhancing and expanding well-being measurement. First, certain issues, especially those related to the environment and inclusion, are not fully captured by SWB metrics. Complementary outcome indicators can be used to incorporate dimensions like sustainability and equity. Second, SWB data often relies on traditional surveys, which limits availability. New data sources, such as big data, present promising alternatives. Third, SWB measures may not always be the best tools to communicate with policymakers. Tools like well-being efficiency metrics and well-being accounting provide meaningful and relatable information to help policymakers.

4.1 Extended Measurements of Well-being

Sustainability: Happy Planet Index

SWB measures alone do not take into account the resources that are used to produce SWB and, hence, the SWB of future generations. The Happy Planet Index (HPI) is a composite index that aims to overcome this limitation by measuring well-being in terms of long, happy and meaningful lives, while considering Earth's limited resources. The HPI measures the number of happy years by multiplying residents' overall life satisfaction by life expectancy, measured as the average life expectancy (in years). The number of happy life years is then divided by the carbon footprint, which is an estimate of greenhouse gas emissions from consumption and economic activity per capita (Abdallah & Marks, 2023). To ensure comparability, all measures are standardized across countries.

The Happy Planet Index faces many of the issues identified above concerning composite indexes. At the same time, it provides an example tool that can be used to measures the sustainability of a country's well-being, not merely its well-being alone, and it is comparable across countries.

Inclusion: SWB inequality

National SWB is frequently aggregated from individual reports using a simple average or mean, yet there may be more or less preferred distributions of well-being with the same mean. Indeed, surveys indicate that U.K. residents tend to prefer more egalitarian societies, with lower well-being inequality,

especially with fewer people experiencing low well-being (Quick & Devlin, 2018). For this reason, well-being inequality should be considered among the dashboard indicators.

Conceptually, well-being inequality is "the degree to which citizens [residents] in a country differ in the enjoyment of their life" (Kalmijn & Veenhoven, 2005). This inequality can be described horizontally across groups of people (e.g., gender, age, and race) (Jorda et al., 2019) or vertically along the distribution of scores. Horizontal inequalities are relatively easy to measure as the difference or gap in well-being means across groups, while distribution statistics like the standard deviation characterizes vertical inequalities. However, due to the ordinal and bounded nature of most SWB measures, most of the proposed vertical inequality measures have limitatins (Grimes et al., 2023).

The Standard Deviation (SD) is the most commonly used statistic for SWB inequality. The problem with the SD is that it is mechanically related to the mean – changing the mean changes the SD even if the distribution has not otherwise changed. Thus, the SD might reflect differences in the mean rather than differences in inequality. A second challenge arises from the bounded scale, which bounds the SD in relation to the mean. The maximum possible standard deviation decreases as the mean moves further away from the middle of the scale (an issue called Structural Dependency) (Kalmijn & Veenhoven, 2005). Thus, if the mean is high or low, the SD can indicate low inequality even if there are important differences (Keeping, 1962; Grimes et al., 2023). Delhey and Kohler (2011) propose two adjusted versions of the SD measure to overcome Structural Dependency, which make the measure relative rather than absolute. Relative dispersion better reflects what matters from both a social and psychological point of view.

The Gini Index is another common statistic for measuring inequality (Gini, 1912). It circumvents some of the limitations of the SD because it measures inequality independently from the mean; however, it is still not intended for use with ordinal data (Kalmijn & Veenhoven, 2005).

The skewness (Grimes et al., 2023) or polarization of the well-being distribution may also be interesting For instance, two different well-being distributions can have the same inequality values, but be skewed in opposite directions, e.g., more people experiencing low well-being. To address polarization, Abul Naga and Yalcin (2008) developed a parametric family of inequality indices, which use inequality ordering that is suitable for any scale (Allison & Foster, 2004).

4.2. Alternative data sources

Survey data has traditionally been the main source for assessing well-being. However, post-pandemic survey fatigue, high costs, and time lags have highlighted the need for complementary tools like Big Data, which provides timely insights into well-being through sources such as social media and Google Trends™.

Big Data are data that are so large, complex, or quickly generated that it cannot be processed effectively using traditional methods. However, in recent years, Machine Learning (ML) techniques have developed to allow us to analyze unprecedented volumes of data, i.e., Big Data. The application of ML to Big Data has allowed researchers to develop new approaches to study people's attitudes, beliefs, and experiences.

In general, the computation of well-being scores using Big Data and ML consists of three steps. The first one is to extract the raw information -- so-called corpus data. In the second step, the corpus is analyzed using pre-programmed lexicons, or dictionaries, that indicate quantitatively how each word or phrase is associated with specific sentiments (positive or negative) or emotions (anger, joy, etc.). In the third and last step, measures of well-being or emotions are computed by averaging the scores of all the observations produced in a unit of time.

Lexicons are based on Natural Language Processing (NLP), an ML technique to understand, interpret, and generate human language (Khurana et al., 2023). NLP involves tasks like text analysis, language translation, and sentiment analysis, and importantly, it can be used to provide the sentiment and underlying emotions of each observation. Currently, the best-known lexicons are the NRC (National Research Council of Canada Emotion Lexicon developed by Turney and Mohammad (2010)) for emotion detection and sentiment analysis, VADER (Valence Aware Dictionary and sEntiment Reasoner), TextBlob, Syuzhet, AFINN and Bing.

Compared to survey data, Big Data can provide larger and more timely data sets at lower costs. Harvesting and processing the data can be performed in nearly real time, which enables continuous monitoring. These tools allow researchers and policymakers to gauge public sentiment, listen to citizens' concerns, observe revealed preferences, and identify important changes as they occur (Rossouw & Greyling, 2024).

Despite its benefits, Big Data has limitations. Even if Big Data can be related to a significant proportion of the population, it is not necessarily nationally representative (Blank & Lutz, 2017). In addition, it is not easy to establish convergent validity as there are few other data sources (for example, surveys) to use as yardsticks. However, a recent systematic review found reasonable correlations between well-being measured through social media text mining and traditional survey methods (Sametoğlu et al., 2024). Another potential limitation is that social media users may present socially desirable emotions, thereby not revealing their true opinions or feelings. Additionally, Iacus and Porro (2021) noted that there could be ethical concerns when using data collected from social media platforms since users may not have given explicit consent to use their posts for research. Lastly, Big Data are not a complete substitute for surveys, as surveys can provide context, nuance, and individual-level information that cannot be captured in large-scale datasets. Big Data and ML can provide information at various levels of aggregation, but not at the individual level.

There are two groups of pioneers generating SWB data from Big Data. First, Dodds and Danforth (2010) used the Hedonometer to construct a real-time measurement of happiness from late 2008 to May 2023. Second, Greyling and Rossouw (2019), whose *GNH.today project* measures happiness and emotions in real time. These data have been used in various studies which provide evidence of the usefulness and validity of well-being measures issued from Big Data and ML (see, for instance, Sarracino et al. (2024), Greyling and Rossouw (2022), Rossouw et al. (2022) and Greyling et al. (2022)). Since 2024, *GNH.today project* has been using information-seeking query data via Google Trends™ to capture the happiness of different countries.

4.3. Better tools for policymakers

WELLBYs

Policymakers are interested not only in whether specific interventions increase SWB but also in how these well-being gains compare to their costs. The WELLBY (Well-being-Adjusted Life Year) is a novel metric of social value and progress, developed to quantify improvements in well-being (Frijters et al., 2024). One WELLBY is equal to one life satisfaction point (typically measured on a 0–10 Likert scale) for one year.

Focusing on SWB alone, as the headline indicator, the WELLBY can be applied in multiple ways. Expected lifetime WELLBYs[6] – life expectancy at birth multiplied by average life satisfaction – provide another largely-comprehensive framework for evaluating human progress and comparing the

[6] Essentially the same as Happy-Life Years per capita (Veenhoven 2010).

performance of different countries (Layard & Oparina, 2021). WELLBYs can also be used to estimate non-market benefits or costs, and as such, are useful for both predicting the potential effects of interventions (ex-ante policy appraisal) and evaluating actual impacts (ex-post analysis). They help policymakers, private organizations, and NGOs aimed at enhancing well-being identify the most cost-effective interventions for improving population SWB. For instance, policies can be ranked by their WELLBYs generated per euro spent. They can also be used in cost-benefit analysis (Layard & Oparina, 2021). For this purpose, the U.K. Treasury has issued guidance on how to monetize WELLBYs. As of 2021, it valued one WELLBY at £13,000, providing a benchmark for use in social cost-benefit analyses (Cooper et al., 2023).

Well-being Efficiency

Current SWB policy advice focuses largely on life conditions, espeically the amount of resources available, not how well they are used. Instead, Sarracino and O'Connor (2022) proposed a measure of countries' performance based on their ability to "produce" SWB, termed well-being efficiency. It aims to indicate how well countries transform their *resources* into SWB. Identifying inefficiencies provides one more lever with which countries can improve well-being. By examining *how efficiently* resources (e.g., income, education, healthcare, public spending) are translated into well-being outcomes, this metric creates a performance-oriented lens for policymakers, who are accustomed to efficiency and cost-effectiveness metrics.

Well-being efficiency is determined first by identifying a best practice "frontier" of fully efficient countries, which score the highest SWB using the fewest resources, and second, by measuring the "distance" in output from the frontier. This is conducted using Data Envelopment Analysis (DEA) -- a non-parametric frontier technique that is widely used to compute productive efficiency in management and economic studies. Future research can also look at using country-specific frontiers as is done in regional economics (e.g., Kounetas et al., 2022).

Ideally, countries' resources improve over time, and their populations feel better, but in the absence of improving resources, countries can still improve SWB by increasing their well-being efficiency. Results from Sarracino and O'Connor (2022) indicate that high SWB tends to go with high well-being efficiency, but not perfectly. Many of the high-scoring countries could achieve even higher well-being if they used their resources more effectively. This insight is particularly important for the low-scoring countries. For instance, increasing well-being efficiency in a country from 50% to 75% would have an impact on SWB that is comparable to increasing its resources, such as GDP, by 50%.

5 Concluding Remarks

In this paper, we clarify the need to move beyond GDP as the primary measure of societal progress and advocate for a comprehensive dashboard of indicators with SWB as a healine measure, in order to provide a better understanding of societal progress. While GDP has historically been a convenient measure of economic output, whose growth has, at least for some time, accompanied and enabled societal progress, it is increasingly evident that this has been possible at the expense of various aspects that matter for quality of life, including the environment.

We argue in favor of SWB as a single headline measure for gauging how people fare with their lives in a given region and year. Tracking its changes over time offers understandable, concise, and valuable insights into societal progress. SWB also offers an organizing principle that distinguishes the conditions of a good life from the outcomes of a good life. Dashboard indicators typically represent the conditions,

and alone, are insufficient to assess the outcomes. Synergyies and tradeoffs between domains may be accomplished using weights determined by their relations to SWB.

Some countries have made notable advances measuirng and applying SWB in decision making. In this regard, the U.K. includes SWB in its Measures of National Wellbeing and has supported a range of experimental applications. Canada's Quality of Life Framework uses life satisfaction as a cross-cutting outcome measure across government departments. Eurostat's 8+1 framework similarly highlights SWB as an overarching outcome dimension. These cases show how SWB can support strategic planning, stewardship reporting, and policy evaluation across domains. Yet overall, these cases remain exceptions. Most national efforts continue to treat SWB as supplementary rather than central.

To improve adoption, we must address concerns over methodology, audience engagement, and conceptual clarity. We reviewed the state of the art in measuring SWB and the relative advantages and disadvantages. For instance, comparison of SWB across countries is limited by cultural comparability, as the importance of SWB and their interpretations vary across cultural contexts. Assessing changes in SWB within countries over time is less subject to cultural concerns, but still faces challenges, as discussed in the text. Relevant advances go a long way towards addressing SWB limitations, for instance, ongoing methodological research, the use of additional measures that account for sustainability and inclusion, and promising new ways of measuring SWB, including WELLBYs, well-being efficiency, and machine learning applied to Big Data.

In conclusion, in this paper we combine insights from different approachs to measuring societal progress, and argue for SWB as a headline measure of a dashboard of indicators to measure societal progress at various territorial levels. The possibility to decompose SWB into its underlying conditions and their relative importance for well-being will provide decision makers with a tool for tracking progress and informing interventions to improve quality of life for all. This approach overcomes the limitations of GDP as a measure of progress, namely its inability to capture non-market aspects of well-being, account for inequalities, and reflect environmental sustainability.

References

Abul Naga, R. H., & Yalcin, T. (2008). Inequality measurement for ordered response health data. *Journal of Health Economics, 27*(6), 1614–1625

Allison, R. A., & Foster, J. (2004). Measuring health inequalities using qualitative data. *Journal of Health Economics, 23*(3), 505–524.

Arampatzi, E., Burger, M. J., Stavropoulos, S., & van Oort, F. G. (2019). Subjective well-being and the 2008 recession in European regions: The moderating role of quality of governance. *International Journal of Community Well-Being*, 2, 111-133.

Barrington-Leigh, C.P., 2021. Life satisfaction and sustainability: a policy framework. *SN Social Sciences 1*. https://doi.org/10.1007/s43545-021-00185-8.

Barrington-Leigh, C., & Escande, A. (2018). Measuring progress and well-being: A comparative review of indicators. *Social Indicators Research*, *135*(3), 893-925.

Battaglia, F. (2022) *To GDP or not to GDP? Identifying the factors promoting and inhibiting the use and impact of well-being metrics in Scotland and Italy*, PhD Thesis, University of Ediburgh.

Beja, E. L. (2014). Income growth and happiness: Reassessment of the Easterlin Paradox. *International Review of Economics, 61*(4):329–346.

Blank, G., & Lutz, C. (2017). Representativeness of Social Media in Great Britain: Investigating Facebook, LinkedIn, Twitter, Pinterest, Google+, and Instagram. *American Behavioral Scientist*, 61(7), 741–756.

Blanchflower, D. G., & Bryson, A. (2024). Wellbeing rankings. *Social Indicators Research*, *171*(2), 513-565.

Bleys, B. (2012). Beyond GDP: Classifying alternative measures for progress. *Social Indicators Research*, 109, 355-376.

Bond, T.N., Lang, K., 2019. The sad truth about happiness scales. *Journal of Political Economy* 127, 1629–1640. https://doi.org/10.1086/701679

Bovenberg, L. & Nicolai, M. (2024) Welvaart in de micro- en macrodomeinen [Prosperity in the micro and macro domains], *Tijdschrift voor het Economisch Onderwijs*, 04-2024, 43-47.

Bruni, L. (2020). Economics, wellbeing and happiness: a historical perspective. In *Handbook on Wellbeing, Happiness and the Environment* (pp. 13-24). Edward Elgar Publishing.

Burger, M. J., & Pang, N. T. P. (2025). Well-being in Asia. *Frontiers in Psychology*, *16*, 1661988.

Cantril, H., 1965. *The Pattern of Human Concerns*. Rutgers University Press, New Brunswick, NJ.

Chen, L., Oparina, E., Powdthavee, N., Srisuma, S., 2019. *Have Econometric Analyses of Happiness Data Been Futile? A Simple Truth about Happiness Scales* (No. 12152), IZA Discussion Paper Series No. 12152.

Clerc, M., Gaini, M., & Blanchet, D. (2010). Recommendations of the Stiglitz-Sen-Fitoussi Report: A few illustrations. *L'economie francaise–2010 edition, Insee, Available as pdf at http://www. insee. fr/en/publications-et-services/default. asp*.

Cooper, K., Fabian, M., & Krekel, C. (2023). New approaches to measuring welfare. *Fiscal Studies*, *44*(2), 123-135.

Costanza, R., Fisher, B., Ali, S., Beer, C., Bond, L., Boumans, R., ... & Snapp, R. (2007). Quality of life: An approach integrating opportunities, human needs, and subjective well-being. *Ecological Economics*, 61(2-3), 267-276.

Deaton, A. (2008). Income, health, and well-being around the world: Evidence from the Gallup World Poll. *Journal of Economic Perspectives*, *22*(2), 53-72.

Deaton, A. (2012). The financial crisis and the well-being of Americans: 2011 OEP Hicks Lecture. *Oxford Economic Papers*, *64*(1), 1-26.

Delhey, J., & Kohler, U. (2011). Is happiness inequality immune to income inequality? New evidence through instrument-effect-corrected standard deviations. *Social science research, 40*(3), 742-756.

Delhey, J., & Kroll, C. (2013). A "happiness test" for the new measures of national well-being: how much better than GDP are they?. In *Human Happiness and the Pursuit of Maximization: Is More Always Better?* (pp. 191-210). Dordrecht: Springer Netherlands.

Diener, E., Lucas, R. E., Schimmack, U., & Helliwell, J. F. (2009). *Well-being for Public Policy*. New York: Oxford University Press

Diener, E., & Suh, E. (1997). Measuring quality of life: Economic, social, and subjective indicators. *Social Indicators Research, 40,* 189-216.

Dodds, P. S., & Danforth, C. M. (2010). Measuring the Happiness of Large-Scale Written Expression: Songs, Blogs, and Presidents. *Journal of Happiness Studies, 11,* 441–456.

Dolan, P., & White, M. P. (2007). How can measures of subjective well-being be used to inform public policy?. *Perspectives on Psychological Science*, *2*(1), 71-85.

Doyal, L., & Gough, I. (1991). Who Needs Human Needs?. In *A theory of human need* (pp. 9-21). London: Macmillan Education U.K.

Easterlin, R. (1974). Does economic growth improve the human lot? Some empirical evidence. In David, P. & Melvin, W. (Eds.) *Nations and Households in Economic Growth* (pp. 98–125). Palo Alto: Stanford University Press.

Easterlin, R.A. (2019). Foreword: Happiness or GDP?, In *The Economics of Happiness: How the Easterlin Paradox Transformed Our Understanding of Well-Being and Progress*. Springer Nature, Switzerland, pp. v–viii.

Easterlin, R.A., & O'Connor, K.J. (2022). The Easterlin paradox. In *Handbook of labor, human resources and population economics* (pp. 1-25). Cham: Springer International Publishing.

Fabian, M. (2022). Scale norming undermines the use of life satisfaction scale data for welfare analysis. *Journal of Happiness Studies*, *23*(4), 1509-1541.

Fleurbaey, M. (2009). Beyond GDP: The quest for a measure of social welfare. *Journal of Economic Literature*, 47(4), 1029-1075.

Frey, B. S., & Stutzer, A. (2010). Happiness and public choice. *Public Choice*, *144*, 557-573.

Frijters, P., Krekel, C., Sanchis, R., & Santini, Z. I. (2024). The WELLBY: a new measure of social value and progress. *Humanities and Social Sciences Communications*, *11*(1), 1-12.

Gaukroger, C. (2023). *A critical assessment of GDP as a measure of economic performance and social progress*. Carnegie UK.

Gini, C. (1912). Variabilità e mutabilità: Contributo allo studio delle distribuzioni e relazioni statistiche (Variability and instability: A contribution to the study of statistical distributions and relationships). *Studi Economico-Giuridici dell'Università di Cagliari, 3*(2), 1–158.

Graham, C., & Pettinato, S. (2002). Frustrated achievers: Winners, losers and subjective well-being in new market economies. *Journal of Development Studies*, *38*(4), 100-140.

Greyling, T., & Rossouw, S. (2019). *Gross National Happiness.today Index*. Available from http://gnh.today

Greyling, T. & Rossouw, S. (2022). Positive attitudes towards COVID-19 vaccines: A cross-country analysis. *PLOS ONE, 17*(3), 0264994.

Greyling, T., Rossouw, S. & Adhikari, T. (2022). The good, the bad and the ugly of lockdowns during Covid-19. *PLOS ONE, 16*(1), e0245546.

Grimes, A., Jenkins, S. P., & Tranquilli, F. (2023). The relationship between subjective wellbeing and subjective wellbeing inequality: An important role for skewness. *Journal of Happiness Studies*, *24*(1), 309-330.

Hayden, A. (2025). The Wellbeing Economy Forum in Reykjavik: in search of alternatives to Davos and the far-right. *Sustainability: Science, Practice and Policy*, *21*(1), 2448871.

Helliwell, J. F. (2008). *Life satisfaction and quality of development* (No. w14507). National Bureau of Economic Research.

Hendriks, M., Burger, M.J., & Takahashi, Y. (2025). The comparability of differently worded subjective well-being measures. Mimeo.

Hitokoto, H., Uchida, Y., 2015. Interdependent Happiness: Theoretical Importance and Measurement Validity. *Journal of Happiness Studies 16*, 211–239. https://doi.org/10.1007/s10902-014-9505-8

Iacus, S. M., & Porro, G. (2021). *Subjective Well-Being and Social Media*. CRC Press LLC.

Jahedi, S., & Méndez, F. (2014). On the advantages and disadvantages of subjective measures. *Journal of Economic Behavior & Organization*, *98*, 97-114.

Jansen, A., Wang, R., Behrens, P., & Hoekstra, R. (2024). Beyond GDP: a review and conceptual framework for measuring sustainable and inclusive wellbeing. *The Lancet Planetary Health*, *8*(9), e695-e705.

Jorda, V., López-Noval, B., & Sarabia, J. M. (2019). Distributional dynamics of life satisfaction in Europe. *Journal of Happiness Studies*, *20*, 1015-1039.

Kainulainen, S., Saari, J., & Veenhoven, R. (2018). Life-satisfaction is more a matter of feeling well than having what you want. Tests of Veenhoven's theory. *International Journal of Happiness and Development*, 4(3), 209-235.

Kaiser, C., & Lepinteur, A. (2025). Measuring the Unmeasurable? Systematic Evidence on Scale Transformations in Subjective Survey Data. arXiv preprint arXiv:2507.16440.

Kaiser, C., Vendrik, M.C.M., 2019. How threatening are transformations of reported happiness to subjective wellbeing research?, *SOCARXIV gzt7a*, Center for Open Science.

Kalmijn, W., & Veenhoven, R. (2005). Measuring inequality of happiness in nations: In search of proper statistics. *Journal of Happiness Studies*, *6*, 357-396.

Keeping, E. S. (1962). *Introduction to Statistical Inference*. Van Nostrand Reinhold.

Khurana, D., Koli, A., Khatter, K., & Singh, S. (2023). Natural language processing: state of the art, current trends and challenges. *Multimedia Tools and Application, 82*, 3713–3744.

Knabe, A., Rätzel, S., Schöb, R., & Weimann, J. (2010). Dissatisfied with life but having a good day: time-use and well-being of the unemployed. *The Economic Journal*, *120*(547), 867-889.

Kogan, A., Sasaki, J., Zou, C., Kim, H., & Cheng, C. (2013). Uncertainty avoidance moderates the link between faith and subjective well-being around the world. *The Journal of Positive Psychology*, *8*(3), 242-248.

Lambert, L., Lomas, T., Van de Weijer, M. P., Passmore, H. A., Joshanloo, M., Harter, J., ... & Diener, E. (2020). Towards a greater global understanding of wellbeing: A proposal for a more inclusive measure. *International Journal of Wellbeing*, *10*(2).

Layard, R. (2020). *Can We Be Happier*? Pelican Books, London.

Layard, R., & De Neve, J. E. (2023). *Wellbeing*. Cambridge University Press.

Layard, R., & Oparina, E. (2021). Living long and living well: The WELLBY approach. *World Happiness Report 2021*, 191-208.

Li, C., Zuckerman, M., & Diener, E. (2019). Culture moderates the relation between income inequality and subjective well-being. *Journal of Cross-Cultural Psychology*, 50(10), 1221-1241.

MacLennan, S., Stead, I., & Rowlatt, A. (2021). Wellbeing discussion paper: monetisation of life satisfaction effect sizes: A review of approaches and proposed approach. *His Majesty's Treasury: Social Impacts Task Force*.

Mahoney, J. (2023). *Subjective well-being measurement: Current practice and new frontiers*. Paris: OECD.

Max-Neef, M. A., Elizalde, A., & Hopenhayn, M. (1991). *Human scale development: conception, application and further reflections*. New York, NY: Apex Press.

Mikucka, M., Sarracino, F., & Dubrow, J. K. (2017). When does economic growth improve life satisfaction? Multilevel analysis of the roles of social trust and income inequality in 46 countries, 1981–2012. *World Development*, *93*, 447-459.

Milanovic, B. (2024). The three eras of global inequality, 1820–2020, with the focus on the past thirty years. *World Development*, *177,* 106516.

Ng, Y-K. (1997) A Case For Happpiness, Cardinalism, and Interpersonal Comparability, *The Economic Journal,* 107, pp 1848-1858.

O'Connor, K. J. (2024). Measuring societal progress. In *Encyclopedia of Happiness, Quality of Life and Subjective Wellbeing* (pp. 337-346). Edward Elgar Publishing.

O'Connor, K. J. (2017). Who suffered most from the great recession? Happiness in the United States. *RSF: The Russell Sage Foundation Journal of the Social Sciences*, *3*(3), 72-99.

O'Donnell, G., & Oswald, A. J. (2015). National well-being policy and a weighted approach to human feelings. *Ecological Economics*, *120*, 59-70.

OECD (2011), How's Life?: Measuring well-being. Paris: OECD Publishing. http://dx.doi.org/10.1787/9789264121164-en

OECD. (2013). *OECD guidelines on measuring subjective well-being*. Paris: OECD Publishing.

Prati, A. & Beuchot, T. (2025) Life satisfaction and the survey fingerprint puzzle. Mimeo.

Quick, A., & Devlin, S. (2018). Measuring wellbeing inequality. Working Paper on the Selection of a Headline Indicator. New Economics Foundation.

Rahman, A. A., Stavropoulos, S., Burger, M., & Ianchovichina, E. (2021). Does institutional quality moderate the relationship between corruption and subjective well-being? *Economics Bulletin*, *41*(3), 975-996.

Ravallion, M. (1997). Good and bad growth: The human development reports. *World Development*, *25*(5), 631-638.

Robeyns, I. (2017). *Wellbeing, freedom and social justice: The capability approach re-examined* (p. 266). Open book publishers.

Rossouw, S., & Greyling, T. (2024). Chapter 41: Big data and happiness. In *Encyclopedia of Happiness, Quality of Life and Subjective Wellbeing*. Cheltenham, U.K.: Edward Elgar Publishing. Available from https://doi.org/10.4337/9781800889675.00051

Rossouw, S., Greyling, T. & Adhikari, T. (2022). The implied volatility of happiness pre and peri-COVID-19: a Markov Switching Dynamic Regression Model. *PLOS ONE, 16*(12), e0259579.

Sametoğlu, S., Pelt, D. H. M., Eichstaedt, J. C., Ungar, L. H., & Bartels, M. (2024). The value of social media language for the assessment of wellbeing: A systematic review and meta-analysis. *The Journal of Positive Psychology*, *19*(3), 471–489.

Sarracino, F., & O'Connor, K. J. (2023). Neo-humanism and COVID-19: Opportunities for a socially and environmentally sustainable world. *Applied Research in Quality of Life*, *18*(1), 9-41.

Sarracino, F., & O'Connor, K. J. (2022). A measure of well-being efficiency based on the World Happiness Report. *International Productivity Monitor*, p. 10-40.

Sarracino, F., Greyling, T., O'Connor, K., Peroni, C. & Rossouw, S. (2024). Trust predicts compliance with COVID-19 containment policies: Evidence from ten countries using big data. *Economics and Human Biology*, 101412.

Sarracino, F., & Slater, G. (2025). The trust paradox. In *A Research Agenda for Social Capital in Economic Development* (pp. 173-195). Edward Elgar Publishing.

Schröder, C., & Yitzhaki, S. (2017). Revisiting the evidence for cardinal treatment of ordinal variables. *European Economic Review*, *92*, 337-358.

Seaford, C. (2013). The multiple uses of subjective well-being indicators. *Social Indicators Research*, *114*(1), 29-43.

Sen, A. (1985). *Commodities and capabilities*. Oxford: Elsevier Science Publishers.

Sen, A. (2009). *The idea of justice*. London: Penguin Books.

Sirgy, M. J. (2019). Positive balance: a hierarchical perspective of positive mental health. *Quality of Life Research*, *28*(7), 1921-1930.

Stevenson, B., & Wolfers, J. (2009). The paradox of declining female happiness. *American Economic Journal: Economic Policy*, *1*(2), 190-225.

Stiglitz, J.E., Sen, A., Fitoussi, J.-P. (2009). *Report by the Commission on the Measurement of Economic Performance and Social Progress*. Paris.

Stiglitz, J.E., Fitoussi, J.-P., Durand, M., 2018. *Beyond GDP: Measuring What Counts for Economic and Social Performance*. OECD Publishing, Paris. https://doi.org/10.1787/9789264307292-en

Tay, L., Herian, M. N., & Diener, E. (2014). Detrimental effects of corruption and subjective well-being: Whether, how, and when. *Social Psychological and Personality Science*, 5(7), 751-759.

Tov, W., & Nai, Z. L. S. (2017). Cultural differences in subjective well-being: How and why. In Subjective well-being and life satisfaction (pp. 50-73). Routledge.

Turney, P., & Mohammad, S. (2010). Emotions evoked by common words and phrases: Using Mechanical Turk to create an emotion lexicon. In *Proceedings of the NAACL HLT 2010 Workshop on Computational Approaches to Analysis and Generation of Emotion in Text* (pp. 26–34). Presented at the NAACL HLT 2010 Workshop on Computational Approaches to Analysis and Generation of Emotion in Text, Los Angeles, CA. https://www.aclweb.org/anthology/W10-02044o mini

Van den Bergh, J. C. (2009). The GDP paradox. *Journal of Economic Psychology*, *30*(2), 117-135.

Van Praag, B.M.S., Ferrer-I-Carbonell, A., 2010. Happiness economics: A new road to measuring and comparing happiness. Foundations and Trends in Microeconomics 6, 1–97. https://doi.org/10.1561/0700000026

Veenhoven, R. (1984). *Conditions for Happiness*. Dordrecht: Reidel.

Veenhoven, R. (2000). The four qualities of life. *Journal of Happiness Studies*, *1*, 1-39.

Veenhoven, R. (2002). Why social policy needs subjective indicators. *Social Indicators Research*, 58, 33-46.

Veenhoven, R. (2003). Arts-of-living. *Journal of Happiness Studies*, *4*, 373-384.

Veenhoven, R. (2010). Capability and happiness: Conceptual difference and reality links. *The Journal of Socio-Economics*, 39(3), 344-350.

Veenhoven, R. (2012). Cross-national differences in happiness: Cultural measurement bias or effect of culture?. *International Journal of Wellbeing*, 2(4).

Veenhoven, R. (2017). Measures of happiness: Which to choose?. In *Metrics of subjective well-being: Limits and improvements*, 65-84.