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Beyond "beyond GDP indicators:" The need for reflexivity in science for governance

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ABSTRACT

"Beyond GDP" initiatives flag the limits of the quantitative indicators of progress currently used for governance. Focusing on the quality assessment of quantitative information used for governance, we use some of the conceptual tools of theoretical ecology and evolutionary biology in order to identify the pre-analytical choices that determine the usefulness and pertinence of a model. Starting from the definition of a model as a formal representation of a specific and necessarily subjective observation, we show that the production of indicators is the final result of a series of decisions on *what* to observe and *how*. These choices, in turn, depend on the narrative, or set of narratives, adopted. Narratives provide causality and context to knowledge claims and are needed to select the indicators to be used for policy. Moving beyond the GDP debate requires reflexivity, that is, awareness of the key role that pre-analytical choices play in the definition of both the relevance of the chosen perceptions and narratives (determined by the normative stands of different actors – who defines wellbeing?), and the usefulness of the chosen models and data (determined by the pertinence of the resulting representation – how to measure wellbeing?). Reflexivity is essential in order to take into account the purposes for which different indicators were created and to define new purposes for the "beyond GDP" indicators.

1. Introduction

In 2007, the Club of Rome, the European Commission, the European Parliament, the OECD and the WWF held the conference "beyond GDP" with the objectives of clarifying "which indices are most appropriate to measure progress, and how these can best be integrated into the decision-making process and taken up by public debate" (EC, 2007). The initiative was the result of the growing criticism of the use of Gross Domestic Product (GDP) as the main indicator in the assessment of economic performance and social progress. A similar strategy was adopted in 2008 by the French president, Nicholas Sarkozy, who created the "Commission on the Measurement of Economic Performance and Social Progress," also known as the Stiglitz Commission, with the aim of identifying the limits of GDP and suggesting better indicators of social wellbeing (Stiglitz et al., 2009). In response to this initiative, the European Commission reports having developed 150 alternative indicators within the EU Sustainable Development Strategy (EC, 2009, p. 29). Yet, in 2014 the debate is still stalled on the need to leave GDP behind (Costanza et al., 2014).

The dissatisfaction with GDP as an indicator of wellbeing has a long history (Fleurbeay, 2009) and has repeatedly been addressed by a number of initiatives, starting from the debate on the limits to growth in the 1970s (Meadows et al., 1972; Nordhaus and Tobin, 1973). GDP is criticised for not distinguishing among positive and negative impacts on wellbeing, as war and natural disasters may result in an increase in GDP, for not taking into account environmental impacts, inequality and gender issues, work conditions, health and intangible capital, defined as human and social capital (EC, 2009). However, GDP is also seen as a useful indicator, which can be used in economic forecasting and country comparisons (EC, 2009, p. 24), it is appealing, in as far as it gives a simple and clear message to policy makers (EC, 2009, p. 31), and easy to understand (Stiglitz et al., 2009) measure of economic market activity. The ambivalent assessment of GDP that emerges from this debate points at the need for a wider analysis of how indicators are produced and used for governance, in order to identify what makes an indicator useful and relevant.

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Funtowicz and Ravetz (1990) attribute the difficulty encountered in the assessment of the usefulness of quantitative indicators for governance to uncertainty. A very broad literature is available on the definitions of uncertainty (see for example, Maxim and van der Sluijs, 2011; Wynne, 1992; Hacking, 1990). In this paper, we focus on the implications of uncertainty for the interface between science and policy. When dealing with uncertainty, scientific rigour does not guarantee that the assessment carried out is relevant. The focus should shift from the quest for truth to the assessment of the quality of the indicators used with respect to social and political goals (Funtowicz and Ravetz, 1993). The same concept was expressed by Simon's (1978) suggestion to replace the concept of "substantive rationality" with that of "procedural rationality." This approach shifts the attention "upstream" (Wynne, 1992) in the process of production of indicators. This paper makes use of theoretical concepts derived from a variety of different disciplines, in order to offer some reflections on the debate about the quality assessment of quantitative indicators used for governance. More specifically, we use the insights offered by some scholars in theoretical ecology, evolutionary biology and semiotics in order to go beyond "beyond GDP indicators" and focus on the quality of the knowledge claims currently used to understand and represent wellbeing.

The focus on the quality of quantitative indicators makes it possible to introduce the concept of reflexivity. Reflexivity is understood here as a call for the careful consideration of values in science for governance (Strand and Canellas-Bolta, 2006). That is, the analysis of how indicators are produced makes it possible to highlight the normative aspect of pre-analytical choices and the role of the analyst in the representation of the observed system. In this framework, quality is defined as fitness for purpose. The quality of indicators can then be assessed in terms of their usefulness and relevance, which in turn makes it necessary to take into consideration the social and political context in which they are used.

The paper is structured as follows: Section 2 introduces the insights of the theoretical ecologist Robert Rosen in order to describe the process of production of scientific information. Rosen's modelling relation is used to characterise the process of production of models and indicators, showing how GDP reflects a specific decision about how the world should be observed and measured. Section 3 highlights the problem of dealing with a plurality of non-equivalent representations of the world and offers an analysis of existing socio-economic indicators based on some of the concepts introduced by theoretical ecology and evolutionary biology. Section 4 reflects upon the role of narratives used in the policy process in order to make sense of a plurality of different representations, determine causality between perceived events, and use anticipatory models to guide action. Section 5 argues that quality assurance of the choice of narratives and models can only be obtained through reflexivity: values and the social context have to be explicitly part of the analysis. Concluding remarks highlight the contribution of theoretical ecology and evolutionary biology to the debate about reflexivity and its implications for the interface between science and governance.

2. The production of indicators for governance: the implications of Rosen's modelling relation

As Bourdieu and Wacquant (1992) argue, *habitus* plays a fundamental role in one's understanding of, and interaction with, the world. As a consequence, it is very difficult to disentangle one's understanding of the world and values from one's *modus operandi*. In relation to our discussion on indicators, this implies that quantitative information has to be analysed in conjunction with an assessment of the theoretical concepts offered by the discipline producing the representation, in this case economics. For this reason, we take the point of view of theoretical biology and evolutionary biology as the starting point of this analysis and as an outside view that makes it possible to analyse both the indicators and the theoretical assumptions underpinning those indicators. The relevance of these disciplines is given by the increasing attention paid to sustainability in the "beyond GDP" debate. As expressed by Stiglitz et al. the focus is on "what will really matter tomorrow for us or our descendants" (2009, p. 242).

Theoretical ecology and evolutionary biology focus on two sets of factors: (i) the pre-analytical choice about the relevant attributes to be observed – this choice defines the scale of the observation, that is the grain and extent of the observation, translating into a specific choice of methods of observation (do we need a microscope, a telescope or an X-ray machine?); and (ii) the characteristics of the observation-observed complex – the physical characteristics of the process used to generate observations and specifically, of the system recording signals from the environment (eyes, antennas, electro-receptors).

The decision of what to observe is necessarily based on the observer's goals and beliefs, and acts as a filter between the observer and the external world (Von Uexkull, 1926; Maturana and Varela, 1980; Rosen, 1985; see also figure 2.4 in Ahl and Allen, 1996, p. 36). For example, when observing nature, one does not know the laws governing it; the observer can only infer them from their observations. As a consequence, the inferred laws may change according to either the point of view adopted and/or the experience accumulated. The sun did not revolve around the earth before Copernicus' findings; the new observation is due entirely to the adoption of a different narrative. In this example, the observed system does not change, what changes is the way the observation is interpreted.

The distinction suggested by Pattee between rules and laws helps distinguish between the observer and the observed system. Laws are dynamic, rate-dependent processes that are generated by the observed system. Rules are linguistic, rate-independent descriptions that are generated by the observer (Pattee, 1977, 1978). Rules are the result of the observer's decision to observe in a certain way (Ahl and Allen, 1996). It follows that the rules defined by different disciplines (for example, economics, thermodynamics, psychology) are used to construct models about the observed system (*homo economicus*, steam engines, behavioural conditioning), as a way to infer the dynamic laws that govern that system. The discussion of rules makes it possible to relate the individual cognitive process to the habits and meanings that emerge from the social context.

In order to see how pre-analytical choices and rules are reflected in scientific information, we introduce Rosen's analysis of models. According to Rosen (1985), a model is defined as the formalisation (representation in a given descriptive domain) of the perception of a particular observed system by a specific observer. We refer to Rosen's modelling relation (Fig. 1) to better clarify this

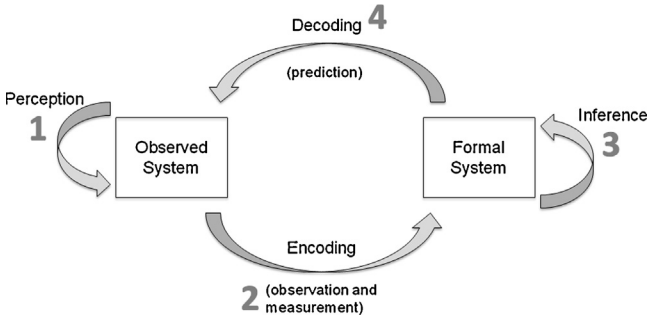

Fig. 1. Rosen's modelling relation.
Adapted from Rosen (1985).