Indicators and information system design

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1. Introduction

The concept of indicator has been extensively studied in sociology, policy sciences and economics. Academic research on economic indicators began in the 1930s and on social indicators in the 1960s. Although the study of indicators in language policy and planning is more recent and still not very well structured, there a good reason to import and adapt to LPP the large stock of knowledge on indicator design already available in other disciplines. This chapter explains the notions of indicator, indicator system and information system. It clarifies why indicators are central in the implementation and monitoring of language policy and planning (LPP), and it presents their properties and how to construct them. After recalling some definitions (Section 2) and some existing experiences in the use of indicators in LPP (Section 3), in Section 4 we present a general methodology to design indicators. In Section 5, we present some applications to the study of linguistic vitality and linguistic unease.

The first systematic indicators to be developed were mainly economic indicators (for a detailed presentation, see Bos 2008). Between 1930 and 1950, the foundations of modern national accounting were laid thanks to the statistical and methodological work of different economists, among others, Simon Kuznets and Colin Clark, and the theoretical contributions of Wassily Leontief and John Maynard Keynes. Indicators such as Gross Domestic Product (GDP), the Gini coefficient for measuring income inequality, and the unemployment rate are classic examples of economic indicators used not only to plan concrete economic policy interventions, but also to collect systematic information on the state of the economy.

The trend towards a general use of indicators to study the various aspects of social life developed in the 1960s and 1970s (the literature is extensive: see, among others, Zajczyk 1997; Land 2014b; Land, Michalos, and Sirgy 2012b). This trend is sometimes named the "movement of social indicators", and it was at the same time a reaction to the use of economic indicators and a deepening of them. On the one hand, the idea that progress coincided with simple economic growth was questioned, and it was therefore necessary to measure other dimensions of the individuals' well-being. On the other hand, this trend was encouraged by a general confidence in the effectiveness of planning in economy and society. It is worth remembering, incidentally, that it was precisely in these years that research into language planning began to develop at the international level (Rubin and Jernudd 1971). After a slowdown in the 1980s due to a general decline in confidence in social planning and corresponding resurgence of trust in the forces of the free market, research into social indicators underwent a period of transformation and reorientation in the 1990s. In several countries, governments continued to publish reports on major social trends, but more attention was paid to developing thematic reports based on indicators in specific areas of social life such as education, crime, fertility and scientific development. From a theoretical point of view, in the 1990s research on social indicators focused on the further development of the concept of "quality of life" and the development of subjective indicators (Land *et al.* 2012a; Michalos 2014). Let us recall that *subjective* social indicators measure a variable to be examined from the point of view of a specific group studied, as opposed to *objective* social indicators that instead aim to measure a variable from the point of view of an external observer. From the 2000s onwards, a large part of the research has focused on the construction of indices, i.e. compound indicators that synthesize several objective and subjective indicators into a single quality of life index. An example is the Human Development Index or the recent Global Multidimensional Poverty Index, both developed by the United Nations. These indices allow international comparisons between countries and over time. Indicators, therefore, are not just numbers; they are instead a measurement tools that acquires meaning within an explanatory model of a complex social phenomenon and/or public policy.

2. Key issues, concepts and definitions

Generally speaking, social indicators are statistical time series "…used to monitor the social system, helping to identify changes and to guide intervention to alter the course of social change" (Ferriss 1988 :601, quoted in Land *et al.* 2012b: 1). Indicators, therefore, perform two essential functions. The first function is to describe a situation, to organize and interpret the data, to present it to the public and to public decision-makers in order to encourage debate and comparison. The second function of indicators is to assist policy makers in the design, implementation, monitoring and evaluation of specific public programmes and policies in

various fields, including the language field. Here, indicators have a more technical function, since they serve as "the measurement of an objective to be met, a resource mobilised, an effect obtained, a gauge of quality or a context variables" (European Commission 2008: 111).

By analogy with the definition provided above we define LPP indicators as time series used to describe a linguistic environment,[1] helping to identify changes and to guide intervention to alter it through policy. LPP indicators, therefore, can be used to describe a situation and to guide an intervention to alter that situation. For example, the "percentage of the population speaking language X on a territory" can be a simple descriptive indicator. It becomes a language planning indicator (and more precisely an outcome indicator of a language policy), when this indicator is explicitly used to measure the effects of a policy aimed at increasing/decreasing the percentage of X speakers in society (e.g. via education).They differ from L *Linguistic indicators* in a narrow sense, which for the purposes of this chapter are defined as indicators that describe some internal characteristics of a language or some features of a language compared to others. An example is the index used to measure the lexical distance between languages (Dyen, Kruskal, and Black 1992). Since, as Fishman notes, "it is status planning, not corpus planning, that is the engine of all language planning success" (Fishman 1991: 347), this chapter devotes particular attention to LPP indicators.

Indicators used in language policy research can be subjective (or perceived) or objective. If the variable to be studied is the usefulness of a language on the labour market, an example of the first type is the level of usefulness perceived by its speakers, where the usefulness is assessed on a Likert scale (or "rating scale"), while an example of the second type of indicator is the average earnings differential associated with competence in a certain language, estimated with labour market microdata.

A *system of indicators* is a coherent set of indicators used to describe a complex phenomenon or to monitor a public policy over time. Planning a language policy without designing an adequate system of indicators means not being able to control whether the policy is developing in the way expected and is leading to the expected results. A system of indicators usually requires the development of a parallel set of procedures to systematically collect the data that are necessary to populate indicators. These procedures together with the system of indicators itself constitute the *information system* of a language policy.

3. Development

The literature on indicators in LPP research is not as vast and developed, whether from a theoretical or an applied point of view, as that of economic and social indicators. There are, however, experiences and studies that it is useful to recall here. We can essentially identify two groups of contributions. The first group consists of literature produced by governmental or intergovernmental organisations responsible for implementing language policy at the national or regional level The second group includes academic publications in which theoretical reflection is generally more developed.

Extensive systems of indicators exist in Canada, the United Kingdom, Spain and, in part, in Switzerland. Spain has two well-developed systems of indicators. The first is the *Sistema d'Indicadors Lingüístics* (SIL) – System of Linguistic Indicators – of the Catalan Regional Government's Directorate-General for Language Policy (Ferret Baig, Solé Camardons, and Torrijos López 2015). The system was initiated in 1998 and reformed different times. It covers seven areas of use of the Catalan language. These areas are referred to as follows: demography, education, socio-economic world, administration, media, culture and digital world, Catalan-speaking territories, and finally external positioning (e.g. presence of Catalan as an object of study in universities). The second system of indicators is the *Euskararen Adierazle Sistema*

[1] A linguistic environment is defined as "a theoretical construct used for analytical purposes. It subsumes in an extensive (but obviously not exhaustive) fashion all the relevant information about the status, in the broadest sense of the word, of the various languages present in a given polity at a certain time" (Grin and Vaillancourt 1997: 49).

(System of Basque Indicators - EAS), launched in 2013 and published by the Department of Culture and Language Policy of the Basque Government. The EAS aims to be a tool to describe the embeddedness of the language in the different spheres of society at a given time and in time, and to follow the implementation of the strategic objectives of language policy (Gobierno Vasco 2018).

In the UK, the Welsh Language Division of the Welsh Government has a set of indicators to monitor the implementation of the its language policy in different domains (Redknap 2013; Welsh Government 2016, 2017). In Canada, the *Office québécois de la langue française* – Quebec French Language Office– regularly publishes reports containing indicators on the language situation in the province of Quebec (OQLF 2019). Particular attention is paid to the vitality of French. At the federal level, language indicators are contained in the Canadian census (Bélanger and Sabourin 2013). The Language Observatory of Italian-speaking Switzerland has developed a set of indicators for the evaluation of the linguistic vitality of Italian in that country (Moretti, Pandolfi, and Casoni 2011) which, however, are not yet populated with quantitative data.

At the international level, the nine criteria for the evaluation of linguistic vitality proposed by the United Nations Educational, Scientific and Cultural Organization (UNESCO 2003) are worthy of note. Some of these criteria such as the "absolute number of speakers" can be viewed as a measurable indicator, whereas others such as "response to new domains and media" are too vague to be used in applied research without further specification. There are also numerous quantitative surveys published at regular intervals by governments or international organizations that include data on resident's linguistic repertoire that can be used to develop indicators (the difference between data and indicator is explained below). These include the *Eurobarometer* and *Adult Education Surveys* (both accessible on the Eurostat website) and the European Union (EU) *Survey on Students' Language Competence*, available on the European Commission website.

The second group of contributions on LPP indicators includes scientific studies of a predominantly theoretical nature. These studies usually focus on assessing the effectiveness and fairness of language policies. Let us mention the indicators to monitor the effectiveness and cost-effectiveness of the policies aimed at supporting minority languages in Ireland, Wales, and the Basque Country (Grin and Vaillancourt 1999), the indicators for the evaluation of EU language policy (Ginsburgh and Weber 2005; Gazzola 2016; Gazzola and Grin 2017); and in international organisations active in patent protection (Gazzola 2014). More recently, indices for measuring linguistic diversity in multilingual organisations and states have been developed (Gazzola, Templin and McEntee-Atalianis 2020; Ginsburgh and Weber 2016). Evaluation indicators have been proposed for language policies in higher education (Grin and Gazzola 2013), A reflection on indicators to evaluate language justice has recently been developed (Gazzola, Wickström, Fettes 2020; Iannàccaro, Dell'Aquila and Gobbo 2018; Gobbo 2018, see Section 5 below). Finally, we would like to mention the contribution of Extra and Yağmur (2012) to the creation of an Index of Multilingual Policies and Practices.

These papers can provide useful examples about indicators and their use in the study of language in society and in LPP. The use of indicators, however, in context-dependent, and language planners need develop their own indicators. This opens the question of the methodology to design them

4. Theory and methods

As Maggino and Zumbo note,

> The process of measurement in the social sciences requires a robust conceptual definition, a consistent collection of observations, and a consequent analysis of the relationship between observations and defined concepts. The measurement objective that relates concepts to reality is represented by indicators. From this perspective, an indicator is not a simple crude bit of statistical information but represents a measure organically connected to a conceptual model aimed at knowing different aspects of reality. (2012: 202).

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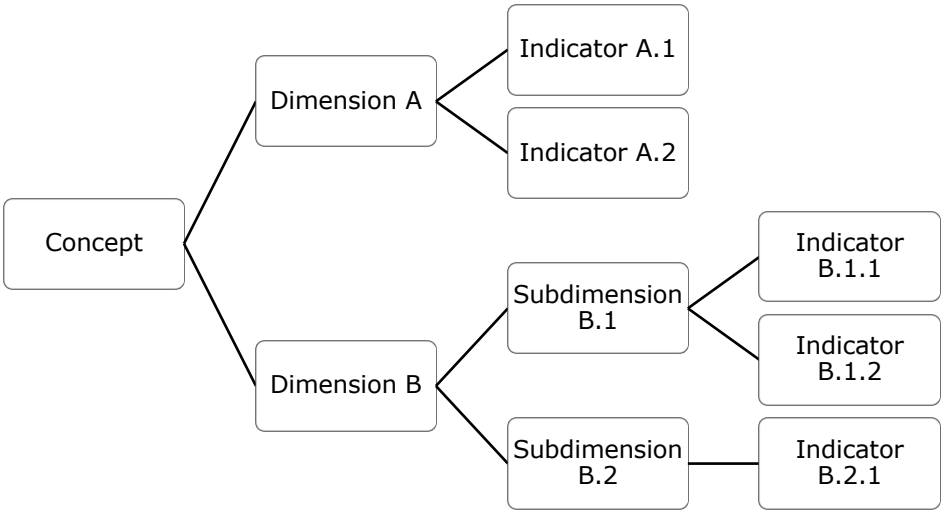
There are two approached to the construction of indicators. The first one is deductive; the second is inductive. The first approach is based on the deductive paradigm first proposed by Lazarsfeld (1958). In this paradigm, the process of developing indicators consists in the gradual decomposition of a complex concept into simpler and measurable dimensions. According to Lazarsfeld, the "process by which concepts are translated into empirical indices has four steps: an initial imagery of the concept, the specification of dimensions, the selection of observable indicators, and the combination of indicators into indices" (1958: 101). The process of decomposition of a complex concept, therefore, continues until measurable units (indicators) are obtained which can be populated with the available data. The construction of indices may not be relevant in some contexts. Figure 1 below provides an example graphical representation of the indicator processing process.

Figure .1: A simple example of decomposition of a concept into indicators



The starting point is usually a complex sociolinguistic phenomenon that can become the subject of language policy, such as, for example, language shift (Fishman 1991) or linguistic justice (see Léger's chapters and Wickström and Gazzola's chapter in this volume). For example, a central concept or complex variable in the study of linguistic shift is that of "linguistic vitality", just as that of "linguistic unease" is important for the study of linguistic justice (see Section 5 below).

The indicator does not correspond to the concept; instead it indicates or represents the concept or one of its dimensions or subdimensions. For this reason, it is usually necessary to use a system of indicators to represent one or more concepts appropriately. As Maggino and Zumbo note, "the set of indicators does not represent a pure and simple collection of indicators but provides researchers with information that is bigger than the simple summation of the elements " (Maggino and Zumbo 2012: 209).

The second approach to indicator design includes inductive elements–as opposed to deduction (Palumbo 2003). Since the lack of data makes an indicator useless, it can sometimes be convenient to start from the available ones to derive from induction suitable indicators to operationalize a concept. It must be said that the development of an indicator system cannot be based entirely on an inductive approach in which there is no reference to an underlying explanatory theory of the phenomenon studied.

It is important to note that the construction of indicators s indicators is not a strictly technical or value-free process. Indicators must have legitimacy to be promoted among their users, that is, they must be recognised as appropriate approximation of the concept examined. A possible way to achieve this is to involve stakeholders and actors in the definition of policy objectives.

To summarise. LPP Indicators serve two main *functions*, that is, to describe a certain linguistic environment, and to assist policy interventions on it. They *nature* can be subjective or objective. They can be designed through a deductive and an inductive approach. There are, however, also other additional ways to classify indicators, and there are particularly relevant to study the

implementation of a policy. We present here three typologies., which are not mutually exclusive.

1. A first distinction is *formal* and is that between elementary indicators, compound indicators and indices. The former are one-dimensional indicators such as "number of years of work" as an objective descriptive indicator of work experience. A compound indicator is the ratio between two elementary indicators. Indexes/indices are the weighted sum or weighted product of several indicators (see Land 2014a, 2014c; Hagerty and Land 2012 for a formal discussion).[2]

2. A second typology organises indicators according to the *stage* of public policy to which they relate. Clearly this typology is relevant only for policy indicators. A distinction is therefore made between indicators of resource (input), output and result (outcome). The concepts of input, output and outcome have already been extensively explained in Gaspard's chapter in this volume, and will not be repeated here. Suffice it to say that input indicators refer to the material, human and financial resources used to implement the policy. Output indicators refer to the direct product of a policy, i.e. what is directly achieved through the resources assigned to the policy, for example, a new library with numerous texts in a minority language. Outcome indicators refer to the effects of a policy on the target population, for example, the number of people (in total or per period of time) who actually use the services of the library.

3. The *evaluation purpose* allows the policy indicators to be organised according to a third typology. Also this typology is relevant only for policy indicators. Resource, output and outcome indicators are used in evaluation to assess the costs, effectiveness, cost-effectiveness and efficacy (or administrative efficiency) of a public policy. These notions have already been extensively discussed in Vaillancourt's chapter in this volume, and will not be repeated here. However, let us remember that the evaluation of the effectiveness of a language policy concerns its ability to obtain results or to achieve the objectives assigned. It is carried out on the basis of outcome indicators rather than direct outputs. The evaluation of costs is informed by input indicators, while that of efficiency is based on the study of the relationship between costs and outcomes (cost-effectiveness). It is important to note that an outcome indicator can be used at the same time as an effectiveness indicator, while an input indicator can be viewed also as a cost indicator. In other words, the typological "label" given to an indicator depends on its use. In the first case, it is a question of using indicators to plan and describe the resources and results of a policy, in the second case the purpose is purely evaluative.

A very important aspect in the design of an information system for a language policy is the examination of the quality of an indicator and of a system of indicators. The most important qualities of an indicators are *validity* and *reliability*. The first property refers to the most accurate possible correspondence between the indicator and the concept under study. In other words, this requires avoiding ambiguous or vague indicators that do not help to explain the constitutive dimensions of a concept. The evolution of the number of doctors in a city, for example, is a textbook example of an ambiguous indicator of health quality in the population. More doctors are usually associated with shorter waiting lists and more effective health care systems, but it can be argued that more doctors are needed precisely because the health status of the population is worsening. The second property is reliability. An indicator is reliable if it is accurate in its measurement, i.e. if its use by two people in the same situation produces the same result within a certain margin of error.

In the same way as individual indicators, an indicator system must also have desirable properties, namely, be *selective*, i.e. not include too many indicators; provide adequate *coverage* of the various dimensions of a language concept or policy; be *relevant*, i.e. not include indicators of little relevance or uselessness to the decision-making process; and finally be *balanced*, i.e. give an adequate representation of the various categories of relevant indicators (e.g. resource, output and outcome). For a more in-depth discussion of the properties of indicators and indicator systems, see European Commission (1999), Maggino e Zumbo (2012), e Wong (2014).

[2] The Human Development Index (HDI) developed by the United Nations, for example, is the weighted sum of three indices that reflect the health of individuals, their income and their level of education. Each index is measured on a scale of 0 to 1 and with a weight of one third in the HDI.

5. Selected Applications

Let us now look at two examples of selection, discussion and proposal of indicators for two important notions in LPP: a much debated one, linguistic vitality, and one that is only recently attracting the attention of scholars, i.e., linguistic justice. A number of tools have been proposed to measure linguistic vitality, some of which are very similar to indicators. This includes measures discussed by Bourhis, Giles, and Rosenthal (1981), Nelde, Strubell, and Williams (1996), Landweer (2000), Coluzzi (2009), Iannàccaro and Dell'Aquila (2011).

These proposals are quite popular and promising, and some are well received by the community of practitioners, but they present a fundamental problem, namely, the insufficiently clear distinction between the dimensions of the analysis and the actual indicators. The dimensions indicated by Iannàccaro & Dell'Aquila (2011) would lend themselves well to a transformation into indicators.[3] The theoretical framework underlying the tables presented here and the different single dimensions are discussed in Iannàccaro & Dell'Aquila (2011: 178-190); here we take up some of these dimensions, expanding them according to the scheme of figure 2, until we arrive at univocal indicators. Let us note that some of the indicators proposed, by construction, produce scores. Of the different possibilities presented in the value an indicator can assume, only one can be true at the level of the single item. Other indicators are constructed as compound indicators. The presence of percentage data, which gives an account of the effective frequency of the values analysed, also allows for easy verification, where necessary or appropriate, of the difference between the legislative possibilities of using the code and its effective use in the proposed situations. (In the following tables we label 'code' any linguistic variety in the repertory; the word is neutral, and its semantic covers the more specific and semantically or ideologically connotated usual terms as 'language'/'dialect'/'idiom'/'variant' and so on).

It is important to remember that the concept of "vitality" is a derived one: what we can concretely measure with indicators is the reciprocal strength of the competing codes in a repertory and the possible extent of the sociolinguistic change in a given community (if we have diachronic surveys). The assessment of the "vitality" of a code is, if anything, a synthetic process that can be done ex post. Moreover, it is always important to keep in mind the aspect of the complexity of repertoires: the vitality of a code can only be determined in relation to that and the uses of others, the "competitors" present in the territory. Table 1 presents different examples of indicators of linguistic vitality. This applies to the proposed sub-dimensions, too. Most of them could be more finely articulated to match the actual conditions of the target community: what follows is a general proposal, useful for a first approach to the problem.

Table 1: Vitality indicators, organised in sub-dimensions

DIMENSIONS OF VITALITY	SUB-DIMENSION 1, PRESENCE	SUB-DIMENSION 2, FREQUENCY / USE MODALITY
1. Functions covered within the administration / official uses	**Indicator 1.1.1. Presence of the code in the administration / official uses** *Values of the indicator*: 0 = the code may not be used in formal documents 1 = the code may be used in formal documents but is not actually employed 2 = the code can be used in formal documents but not as an official version 3 = the code is mandatory in formal documents alongside an equally compulsory one 4 = the code is mandatory in formal documents alongside non-compulsory one 5 = the code is the only admissible language in formal documents	**Indicator 1.2.1. Frequency of the code in the administration / official uses**: % of the documents published in the code per calendar year **Indicator 1.2.2 In situ use of the code within the administration** % of actual communicative exchanges in the code per working week

3 Quite well-known is Fishman's 8-level Graded Intergenerational Disruption Scale (GIDS, Fishman 1991), which might be considered in its way a set of macro-indicators, albeit not directly operational. We will not discuss it here – the table 22.1. offers some contact points with GIDS, proposing a few operationalisations of its stages.

2. **Social life**	**Indicator 2.1.1. Presence of the code in the media** 0 = the code is not present in the media at all 1 = the code is present in non-official media alongside other codes 2 = the code is present in the official media alongside other codes 3 = the code is the only one in the media [*depending on the specific conditions of the territory, if it is considered useful this indicator can in turn be divided into dedicated sub-indicators for radio, television, newspapers, internet and so on, maintaining the same values*]	**Indicator 2.2.1 Frequency of the code in official media** % of broadcasting hours per year in which the code is used in official media **Indicator 2.2.2 Frequency of the code in non-official media** % of broadcasting hours per year in which the code is used in non-official media
3. **School and education**	**Indicator 3.1.1. Language status in the school** 0 = the code is not tolerated in the school 1 = the code is informally present at school 2 = the code is taught at school as a topic 3 = the code is a medium of instruction alongside other codes 4 = the code is the principal or unique medium of instruction	**Frequency and use of the language in the school** **Indicator 3.2.1.** % of communicative exchanges in the code **Indicator 3.2.2** % of teaching hours *of* the code **Indicator 3.2.3.** % of the subjects whose titles mention the name of the code alongside with expressions such as "tradition", "customs", "past" or similar **Indicator 3.2.4** % of teaching hours *in* the code **Indicator 3.2.5** % of hard science-related subjects in which the code is used as medium of instruction

4. **Attitudes toward the status of the code**	**Indicator 4.1.1. Attitudes toward the status of the code** 0 = the code is considered a dialect (or a set of dialects) by the majority of its native speakers 1 = the position of the code is uncertain / debated by majority of its native speakers 2 = the code is considered a language by the majority of its native speakers **Indicator 4.1.2. Status claims of the code** 0 = there is no claim for any particular status of the code by the majority of its native speakers 1 = claims are sporadic and random 2 = there exists a coherent and deep-rooted claim for the language status of the code	
5. **Code evolution within the community**	**Indicator 5.1.1. Evolution of the number of people who are able to use the code, in absolute figures** 0 = the number decreases over time 1 = the number is stable 2 = the number increases over time **Indicator 5.1.2. Evolution of the number of people who are able to use the code, vis-à-vis the other codes present** 0 = the number is diminishing compared to the others in the area 1 = the number is stable in comparison to the others present in the area 2 = the number is increasing compared to the others in the area	**Indicator 5.2 Evolution of the frequency of speakers in time series** [if available]: diachronic series related to the% of residents with knowledge of the code (censuses and so on)

	Indicator 5.1.3. Relative chronology of speakers' competence in the code from 0 = the code is precariously mastered only by elderly people to: 6 = the code is stable throughout the community [according to different degrees of mastering by age groups]	
6. **Code value for the community**	**Indicator 6.1.1. Code value for the in-group belonging** 0 = the competence in the code is not required for the in-group belonging 1 = the competence in the code is necessary for the in-group belonging **Indicator 6.1.2. Code value for the community's cultural memory** 0 = the code is not considered an integral part of the community's cultural repertoire 1 = the code is considered an integral part of the community's cultural repertoire	**Indicator 6.2.1. Code frequency for the in-group belonging** % of non-speakers of the code, who however are considered part of the in-group **Indicator 6.2.2. Code frequency for cultural memory** % of the usage of the code in standardized writings (short stories, proverbs, jokes etc.) on the total of written community productions
7. **Linguistic autonomy of the code**	**Indicator 7.1.1. Autonomy of the code in the conversation** 0 = it is not possible to carry an ordinary conversation using the code alone (without mixing it with another one) 1 = it is possible to carry on an ordinary conversation using the code alone	**Indicator 7.2.1. Frequency of code-switching** % of the interactional exchanges (whose matrix language is the code) in which there is a clear presence of code-switching / mixing, on the total exchanges in the code
8. **Sociolinguistic care toward the code**	**Indicator 8.1.1. Institutional attention toward the code** 0 = the use of the code is forbidden 1 = the code is ignored by the institutions 2 = the code is actively promoted by local institutions 3 = the code is actively promoted by national institutions **Indicator 8.1.2 Local care toward the code** 0 = there are no associations protecting or promoting the code 1 = the associations protecting or promoting the code are few and uncoordinated 2 = protection or promotion of the code are active and supported by the population	**Indicator 8.2.1. Frequency of intergenerational transmission** % of non-speaking children from families with both speaking parents **Indicator 8.2.2. Frequency of intergenerational transmission** % of non-speaking children from families with one speaking parent

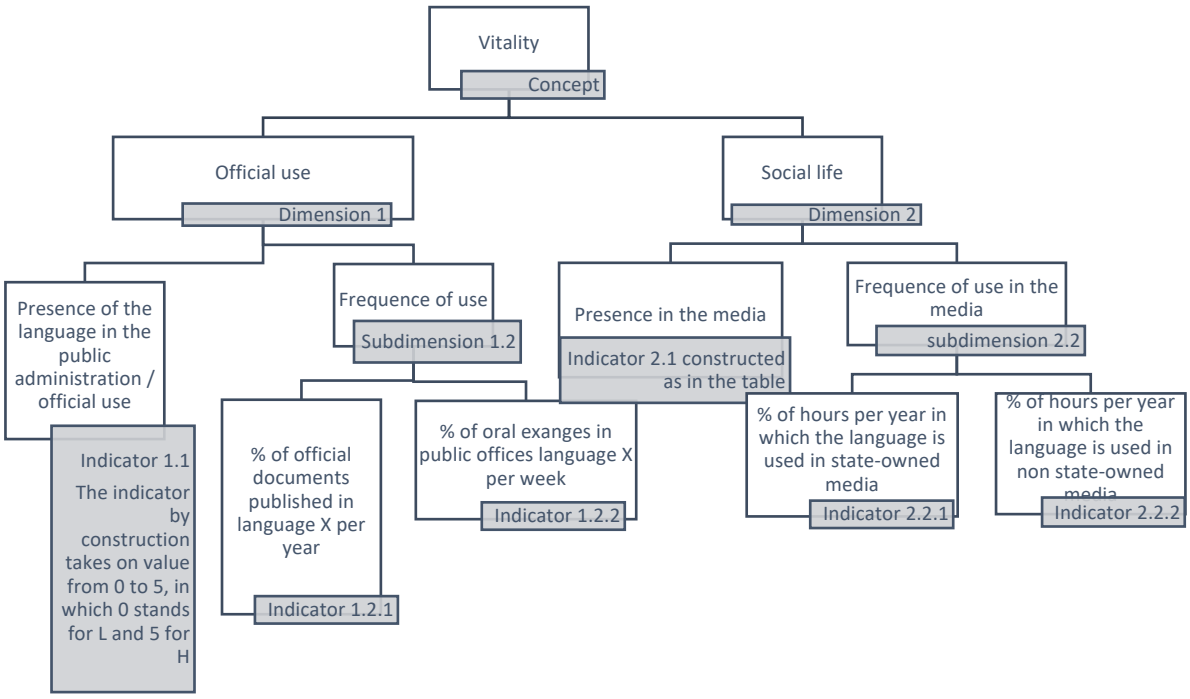
Note: the first column offers a reference to the dimensions described in Iannàccaro & Dell'Aquila 2011, to which we refer; some dimensions are left out of this table

Several indicators whose value may be expressed in absolute numbers presented in the table are arranged on a scale varying from 0 to maximum 6 (indicators in percentage are designed so that they can be translated into absolute ones). The more or less roughly computed value associated to a code - in comparison with the values of the competing codes - should already give a general idea of the relative vitality of a language, but obviously this result would be too simplistic, and should therefore be refined. A proposal in this line can be found in Iannàccaro & Dell'Aquila (2011). For lack of space, we would simply recall that the resulting vitality level is based on a mix between data on the presence of a language and its frequency of use. Such data can vary according to the community analysed. Results are then normalised by pointing out the trend in vitality (e.g. increasing or decreasing) and parameterising them according to the presence and strength of competitors.

Figure 2 transposes some parts of the table into a diagram (deliberately limited to dimensions 1 and 2 in Table 1), in order to highlight the logical steps leading to the indicators through a process of specification.

Let us move to a second complex concept that has recently come to the attention of language policy scholars, namely "linguistic unease". This is defined as "a situation in which speakers feel that their pragmatic linguistic competence is not fitting the communicative requirements of the linguistic act they are about to perform-or even that the symbolic value of their speech acts is perceived as misplaced" (Iannàccaro *et al.* 2018: 367). The linguistic unease leads to individual communicative and social disadvantages, but also to drawbacks for the community, causing the loss of skills and competitiveness of the whole community that can ultimately entail economic costs (Iannàccaro & Dell'Aquila 2016, Iannàccaro 2018). A set of appropriate descriptive and policy indicators for linguistic unease can help to set up a policy aimed are reducing linguistic disadvantage in certain areas such as institutional communication or essential public services, thereby improving justice.

Figure 2: Examples of vitality indicators



Dimensions of linguistic unease can be, for instance, different degrees of competence in particular codes – which are particularly praised by the society for school, administrative or even informal, symbolic and in-group function. Therefore the process of extracting indicators from these dimensions starts here from the observation of concrete communication problems that could be subject to policy in order to inductively derive general dimensions through their categorization and aggregation into broader concepts (see Table 3). This is due to the diversity of aims and approaches that currently characterizes the research on linguistic unease compared to that on vitality. As regards linguistic unease, it seems to us that only some of the descriptive dimensions discussed in the table– or the combination of some of these dimensions – can develop diagnostic or analytical value. The point then is to transform a descriptive scheme into an analytical one, and to identify the tools to arrive at a concrete knowledge of reality through the choice of quantifiable data that are easily measurable. Linguistic unease is an emic condition, experienced by individuals, and for this reason it is difficult to seize and quantify. The indicators suggested here are however etic in the sense that they reflect an

external point of view and include percentage values. These indicators are very recent and still need to be tested.

Table 3: Linguistic unease Indicators examples

UNEASE DIMENSION	SUB-DIMENSION: INDIVIDUAL/COMMUNITY GAP	UNEASE INDICATOR
1. **Unease in relations with the public administration and with writing**	**Sub-dimension 1.1. Ignorance of the high* code(s)**	**Indicator 1.1.1. Ignorance of the H code(s)** % of the population who does not understand an administrative act (in any of its versions if the administration is multilingual) **Indicator 1.1.2. Effective use of H code(s)s** % of reported misunderstandings of administrative acts per calendar year
	Sub-dimension 1.2. Ignorance of the standard spelling of the official codes	**Indicator 1.2.1. Ignorance of standard spelling** % of the population not able to write in the standard language(s) **Indicator 1.2.2. Standard spelling yield** % of written productions of the community with spelling errors
3. **Unease in personal and informal communication**	**Sub-dimension 3.1. Ignorance of low and informal use codes**	**Indicator 3.1. Deficiency in oral production** % of the population unable to speak the current language(s) of the community (including minority languages or local dialects, if of widespread use)
	Sub-dimension 3.2. Ignorance of in-group codes	**Indicator 3.2. Deficiency in oral comprehension** % of the population unable to understand a conversation in L* in informal settings such as bar/pub
4. **Unease in school and education**	**Sub-dimension 4.1. Poor competence in school languages**	**Indicator 4.1.1. Deficiency in understanding and performance at school** % of students who do not reach the threshold value of school performance set by the authority **Indicator 4.1.2. School drop-out rates** % of students abandoning school by school year **Indicator 4.1.3. Class repetition rates** % of students experiencing class repetition
	Sub-dimension 4.2. Poor competence in the international language taught at school	**Indicator 4.2. Deficiency in the international language** average performance of students in the L2 taught at school [attention: 'performance', rather than 'knowledge': that is the compliance of students with what is required by the institution in that territory, rather than the theoretical knowledge of the codes]

**Note: H stands for "high" (in the sense of prestigious/formal) and L for "low" (informal).*

6. Challenges, debates and perspectives

Given the complexity and multidimensionality of sociolinguistic processes, indicators should be used carefully to avoid simplistic conclusions. For example, quantitative analyses can be enriched with qualitative analyses. Furthermore, the decision-maker must always take into account the effect of exogenous events on the effectiveness of language policy. Finally, the choice of indicators, being a choice, contains elements of arbitrariness. The choice of indicators is not neutral, as it filters information and it orients policy measures by defining outcome. This issue is nicely captured by the "Campbell law", according to which "the more any quantitative social indicator is used for social decision-making, the more subject it will be to corruption pressures and the more apt it will be to distort and corrupt the social processes it is intended to monitor" (Campbell 1979). A good example is the use in some international

university rankings of the "percentage of foreign students" as an indicator of quality of research and teaching. As soon as universities internalised this indicator in their development strategies, is became an objective to achieve by different means (e.g. subsidizing foreign students), and it ceased to be an objective measure of quality.

This notwithstanding, the use of indicators in the study of sociolinguistic phenomena and in LPP remains indispensable. It is particularly important for the indicators to have a solid theoretical basis justifying their relevance to the phenomenon studied. It is worth noting, in conclusion, that the main purpose of LPP indicators is not to "quantify" reality, but to understand in which direction the linguistic environment evolves as a result of general changes or as a result of LPP measures. Since the subject of this handbook is language policies, the approach adopted is necessarily partial, and the analysis necessarily comparative and aimed at assessing incremental changes.

7. Further reading

Moretti *et al.* 2011) have developed a set of indicators of the linguistic vitality of Italian in that Switzerland. Grin and Gazzola (2013) develop different indicators for the evaluation of language policies in international organisations, higher education institutions, and companies. These indicators were as part of a European research project on "Language dynamics and management of diversity" (DYLAN project, 2006-2011, Framework programme 6). Ferret Baig *et al.* (2015) present the *Sistema d'Indicadors Lingüístics* (SIL) of the Catalan Regional Government's Directorate-General for Language Policy.

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