



**International Society
for Quality-of-Life
Studies
(ISQOLS)**

The State of the Art in Indicator Research



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The State of the Art in Indicator Research II

Particular issues in managing indicators of well-being

- aggregating indicators
- aggregating individuals
- complex indicators and their roles



Introduction

Consistent application of the hierarchical design produces a **complex** data structure.

The complexity refers to
three data dimensions
to be managed





Introduction

Elementary Indicators

(several indicators for each variables)

Cases/Units

(several cases observed for each indicator)

Variables

(several variables defined consistently with the conceptual model)



Introduction

each data dimension may require a particular treatment



strategy to reduce data structure



- i. construction of synthetic indicators* (aggregating elementary indicators)
- ii. definition of macro-units* (aggregating cases/units)



Aggregating elementary indicators



Aggregating indicators

two different criteria

reflective ↔ formative

statistical assessment ⇒ analytical approaches



common factor analysis ↔ principal component analysis



Aggregating indicators

📌 **Reflective** criterion

Statistical properties of reflective indicators

- **indicator are interchangeable** (the removal of an indicator does not change the essential nature of the underlying construct)
- correlations between indicators are explained by the measurement model
- **two uncorrelated indicators cannot measure the same construct** (internal consistency)
- **each indicator has an error term**
- measurement model estimated in the ambit of a **larger model that incorporates effects of the latent variable**



Aggregating indicators

📌 **Formative** criterion

Properties of formative indicators:

- **indicator are not interchangeable** (omitting an indicator is omitting part of the construct)
- **correlations between indicators are not explained by the measurement model**
- **two uncorrelated indicators can both serve as meaningful indicators of the same construct** (internal consistency is not important)
- **indicators do not have error terms**



Aggregating cases / units



Aggregating cases

Aggregation of cases/units is required in order to lead information to be analysed at the same level

		level of observation	
		micro	macro
information	objective	<p>compositional information (individual living conditions)</p> <p>↓</p> <p>aggregation</p> <p>(e.g. proportion of people living in poverty)</p>	<p>contextual information</p> <p>↓</p> <p>no aggregation problem</p>
	subjective	<p>subjective information (subjective well-being)</p> <p>↓</p> <p>aggregation</p> <p>(?)</p>	<p>not observable</p>



Aggregating cases

Aggregation of objective information

a. Compositional criterion

e.g. proportion of people living in poverty

b. Contextual criterion

no particular aggregation problem



Aggregating cases

Aggregation of subjective information

a. Homogeneity criterion \Rightarrow typologies

analytical approaches: cluster analysis

b. Functionality criterion \Rightarrow areas, regions, ...

analytical approaches: means?



Aggregating cases

a. ***Homogeneity criterion***

*Information are aggregated if
the individual cases are
homogeneous according to
the characteristics of interest*



Aggregating cases

*b. **Functionality criterion***

*the values are aggregated if
the individuals belong to
pre-existent higher-level units
defined in terms of:*

- **groups** (social, generational, etc.)
- **areas** (geographical, administrative, etc.)
- **time periods** (years, decades, etc.)



Complex indicators and their roles

Need of composite indicators (Noll, 2009)

- answer the call by 'policy makers' for condensed information
- improve the chance to get into the media (compared to complex indicator systems)
- allow to make multi-dimensional phenomena uni-dimensional
- allow to compare situations across time more easily
- compare cases (e.g. nations) in a transitive way (ranking)
- allows clear cut answers to questions like the following:
 - o are living conditions getting better or worse across time?
 - o do people living in City A enjoy a better quality of life than those living in City B?
 - o is population subgroup X better off than population subgroup Y?



Complex indicators and their roles

OBJECTIVE → aggregation of different indicators in a unique value referring to each unit of interest

PROS → manageability of the obtained results

CONS → conceptual, interpretative and analytical problems of the obtained aggregation



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Thank you for your attention