# Data Quality in Social Survey Research

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## INTRODUCTION[1]

The social survey research community has always felt the need to identify and share criteria for assessing the quality of collected and analysed data. Data quality is a fundamental aspect of social survey research that comes from the diffusion and usage of large-scale surveys planned without adequate methodological design. In the long tradition of reflections on the data quality in surveys, it seems that two antithetical positions prevail: according to the behaviourist paradigm, data quality is the absence of distortions in the measurement process (Groves, 1991); otherwise, the pragmatic position conceptualises data quality as the satisfaction of the logical and methodological conditions necessary for the achievement of the cognitive research's objectives (Mauceri, 2003).

The first position originated in psychometrics, and social survey methodology imported it. The nineteenth century saw the spread of what Von Hayek (1989) called the scientist attitude, according to which the human sciences can develop only by following the guidelines, the method and the procedures of the physical sciences. The gradual devaluation of the philosophical differences between the physical and human sciences has transferred to the social sciences, mainly quantitative social science, giving rise to the so-called survey methodology. This approach is based on measurement theory that conceives data quality as the absence of error in the measurement process: the researcher investigates the sources of error that can move the measured values away from the true values (Groves, 2004).

Other scholars criticise this scientific attitude and claim the social sciences' ontological, epistemological, and methodological autonomy from natural and physical sciences (Marradi, 2016). Rejecting the idea that only one model of science exists (that one of hard sciences) and accusing social scientists of denying their philosophical origins - because the models of the physical sciences attract them - these scholars have given rise to a pragmatic view on data quality debate. The pragmatic approach looks at the actual conditions of research and the cognitive goals that move it. "There is data quality when the researcher succeeds in fulfilling the logical and methodological conditions necessary to achieve the cognitive objectives of the research" (Mauceri, 2003, p. 41).

Analysing these two paradigms is necessary to understand the complex data quality topic.

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## BACKGROUND

The attention to data quality measurement originated in psychometrics, whose roots are in the behaviourism paradigm, born in the early 1900s when the focus of the academic community of psychologists shifted from introspective methods to external environments in order to understand and explain human behaviour. Behaviourism has transmitted its appeal to social survey methodology by attempting to pursue "the comparability of responses" through the invariance of the stimuli and the standardisation of the interview situation (Fideli & Marradi, 1996, p. 74). The mechanical stimulus-response model represents the survey interview as follows: the stimulus (the questionnaire's question) is characterised by a high degree of structuring, and the respondents have to answer the same questions in the form and order designed by the researcher (Gobo, 1997). Fowler and Mangione summarise the core of the behaviourist manifesto in survey research: "the key element of measurement is standardisation. Standardisation aims to expose all respondents to the same question and response alternatives. In this way, differences can be interpreted as actual differences among respondents" (1990, p. 14). The highly standardised interview theorised by behaviourists requires establishing strict rules, especially regarding the interviewer's role, which is conceptualised as one of the leading causes of measurement error in the survey. In this approach, the perfect behaviourist interviewer has high skills to follow standardisation rules, administering stimuli designed by others within the cage imposed by standardisation in order not to introduce bias and errors during the interview (Biemer et al., 1991).

According to the measurement theory, the act of measurement in a survey produces an empirical observation, which incorporates an error from the true value. The measurement theory intends to study and tackle the errors from the true values observations. Several authors, such as Deming (1944) and Kish (1965), have contributed to conceptualising the social survey error. Andersen et al. (1979) theorised the total survey error, identifying the effects of the different error sources. Then Biemer and Lyberg (2003) introduced the conceptual specification error (the inadequate and poor specification of object investigation) and the processing error (i.e. data cleaning, coding, data entry, and statistical weighting). For Groves (2004), survey methodology was born to study the error sources that, either randomly or systematically, affect the quality of all survey phases. The scholar has differentiated the systematic error between the observation error (the distance between a subject's answer and the subject's true value on the measured property) and the non-observation error caused by statistical estimation error (the distance between the sample value and the population value).

The measurement theory in survey research comes from the positivists' and neopositivists' epistemological framework: the task of science is to pursue the truth (objective knowledge), and the scientist's task is to discover the reality without introducing any element of personal interpretation. This idea of science refers to objectivist gnoseology: the conceptual structures with which the researcher represents the object under investigation are not free creations of the human intellect but are provided naturally by the object itself through the sensations emitted to the perceiving agent. "The etymology of the term 'data' emphasises the passive attitude of the researcher" (Bruschi, 1990, p. 224) because the data would be coercively imposed by an objective reality external to the researcher that can be grasped only through scientific activity (Agnoli, 1992, p. 144).

An alternative theoretical approach to the quality of data in social survey research, labelled by Mauceri (2003) as pragmatic, rejects the existence of true data - and the measurement theory - and defines data as the outcome of a process, "the product of operations of selection, collection and formalization" (Statera, 1994, p. 125) that the researcher deploys to achieve the cognitive research goals. Data is the lowest unit of information that, after being collected and formalised, is coded into a matrix and subjected to further

processing operations. Several researchers' choices constructed data. Data is not the subject's true value on the property; it is the final output of more general and complex construction processes that include several steps and operations. This methodological position derives from the epistemological conviction that scientific research has nothing given and objective (Statera, 1994).

Weber was the most influential sociologist to overturn the positivist gnoseological certainties. The concepts are not copies of objective reality, but they "constitute a means to the end of intellectually mastering empirical phenomena, and can be just that (...) Concepts and judgments are neither empirical reality nor do they copy it, but they allow to order the empirical phenomena in an efficient conceptual way" (1904/1958, pp. 129-134). With such conditions, human thinking needs criteria to select portions of reality and order them according to its own needs. The tools available to the individual, without which one person would be blind to the infinite mutability of reality, are the concepts Weber defines as 'relation to value' tools to break "the correspondence between concepts and reality" (Cavalli, 1981, p. 37). By this expression, Weber means that knowledge, especially scientific knowledge, starts from particular points of view. "Continue to believe that these viewpoints can be extracted from the object of knowledge itself is a form of naive delusion of the specialist who does not realise the fact that it is by the Wertbeziehungen (relations to value) he/she has extracted, from an infinity of elements, the single one that interests him/her. Without the Wertbeziehungen of the researcher, there would be no principle of empirical material selection nor any knowledge endowed with the sense of the real" (Cavalli, 1981, p. 97).

Later, Marradi criticises the realist gnoseology, in which the concepts we discover our object are not problematic because they reflect reality isomorphically. "Since our concepts faithfully reflect our objects, they cannot be questioned; so, we focus on the asserts (in the form of laws) that will tell us how those objects behave" (2007, p. 77). However, those who pursue this path fall into the assertory fallacy: formulating true assertions about the objects of the world is guaranteed by an objective epistemology. For these reasons, an external reality that imposes its conceptual categories on the researchers does not exist: sociological data are not ready-made for the researcher. Instead, the researchers' choices construct data, employing points of view and value options that shed light on one part of the object rather than another.

Starting from the literature review about the main data quality paradigms in survey research, the chapter intends to focus on the data quality dimensions of social survey research from its pragmatic perspective, which rejects the concept of true value and looks at the actual research conditions that drive the survey experts by enhancing the researchers' distinct choices during their pathway.

## FOCUS OF THE CHAPTER

### Data Quality Dimensions in Survey Research

Data construction in social survey research is an iterative process that includes several stages. In this process, the researcher is aware of the responsibility of governing that process because his/her decisions design the data quality. Assuming the pragmatic perspective, data quality satisfies the logical and methodological conditions necessary for achieving the cognitive objectives of the research". Data with these characteristics make explicit the purposes of the research because they constitute adequate material for testing the initial hypothesis. Quality data do not produce a real outcome but an ideal one because data are suitable for answering the original and ongoing research questions.

For this reason, data quality is a multidimensional concept that refers to the following aspects (Table 1):

- the relevance of the conceptual map;
- the validity of the indicators;
- the data fidelity;
- the semantic standardisation of the interview.

*Table 1. Data quality dimensions from pragmatic and behaviourist paradigms*

| | Pragmatic paradigm | Behaviourist paradigm |
|---|---|---|
| **The relevance of the conceptual map** | The researcher decides which properties are relevant to the investigation before the data collection starts. | Properties are imposed by the investigation object. The researcher merely investigates them. |
| **The validity of the indicators** | The researcher establishes the relationship between the general concept and the selected indicators. | The validity procedures based on the subjectivity of the researcher are highly criticised. |
| **The data fidelity** | Data fidelity is the property of the relationship between the operationalized concept and the outcome provided by its operational definition. | Reliability is the essential attribute of the survey instrument and its stability and precision during the measurement act. |
| **The semantic standardisation of the interview** | The interview has a pronounced interactive and relational character in which communicative and interpretive complex processes act. | The interview situation pursues interviewers' and respondents' standardized behaviours, to achieve the comparability of responses. |

## The Relevance of the Conceptual Map

The conceptual map is a "network or flow chart in which the chosen concepts are placed on a sheet and related to each other using arrows" (Marradi, 2007, p. 203). The conceptual map helps the survey researcher to decide which properties are relevant to the investigation before starting the data collection. The conceptual specification phase culminates in selecting relevant properties to represent the research problem (Agnoli, 1994) and guiding the successive research steps. The necessity of using the conceptual map arises from a general problem not properly conceptualised, bringing to a potentially infinite number of research questions. However, it is appropriate not to include properties only in an empirical sense in the conceptual map. Due to the close interdependence between theory and research, the guiding criteria of the researcher in including specific properties must be theoretical because the concepts make sense within a theoretical framework that connects them (Goode & Hatt, 1952).

However, the relevance and utility of the properties included in the conceptual map are not limited to the researcher's point of view. It must also include the respondent's point of view (Pitrone, 2009) because the researcher cannot assume that the properties in the map are equally essential to the survey participants, too (Parten, 1950; Scott, 1968). Therefore, the stage of research deputed to bring out this bottom-up relevance is the study pilot, in which the researcher lets the interviewees speak freely through unstructured techniques (in-depth interviews, focus groups, et cetera). In this way, the researcher identifies new properties relevant for the respondents to include in the conceptual map. A good conceptual map is selective. Otherwise, the risk of over-representation exists when included properties are entirely or partly irrelevant to the cognitive goals of the research. In this case, the constructed data performs a disruptive function because it directs research operations toward irrelevant properties. On the other hand, under-representation occurs when the properties initially considered irrelevant - not included in the conceptual map - become central during the investigation (Mauceri, 2003).

## The Validity of the Indicators

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A further aspect of data quality is the choice of indicators. According to Lombardo (1994), using the term indicator is legitimate when the researcher establishes a stipulative relationship of semantic representation between the general concept and the specific concept that suggests the final operational definition. For example, many concepts of high theoretical relevance have no operational definition; these concepts need the help of concepts with a lower level of generality capable of suggesting immediate operational definitions. Thanks to this relationship of semantic representation, respondents' states on the indicators are referable to the general concept. The researcher finds multiple indicators for the same general concept. The choice of the most suitable indicators depends on the research context and the methodological sensitivity of the researcher. Choosing good indicators is crucial; this dimension greatly impacts the final data quality.

Therefore, validity is the criterion for selecting indicators that contribute most to the data quality. Validity is not a property of the measurement act but a property of the relationship between the general concept and the indicator, as established by the researcher (Pitrone, 2009). There are several strategies for determining one or more valid indicators. The first one is called by Bruschi (1996) and Campelli (1999) content validity. Content validity does not produce any algebraic coefficient; the theoretical reflection assesses the validity of the selected indicators. However, behaviourist researchers find this strategy unscientific because it depends on the researcher's subjectivity. Their judgment is also negative on the validation by known groups. To control the validity of selected indicators, researchers administer the test to a known group, known because that specific property, too general to be inquired about directly, is considered prevalent within the group in question. If the test results confirm that the indicators are widely present in that known group, then the test is valid because it detects the general property that the researcher hypothesised to be present within that known group (Frey, 1970).

Other forms of validity involve calculating coefficients of association among vectors in the matrix. Concurrent validation calculates the coefficient between properties considered valid indicators of the same general concept. If there is an association, the hypothesis of indicator validity is confirmed (Carmines & Zeller, 1979). However, Marradi (2007, p. 177) argues that "this proves nothing conclusive because nothing prevents the association signals that they are all indicators of another concept".

In addition, construct validity exists. The indicator to be validated does not associate with other supposed indicators of the same general concept but with other variables that, according to the theory, have a solid relationship with the general concept. The indicator is valid if it is empirically associated with the variables in question, matching the theory's expectations (Carmines & Zeller, 1979; Cronbach & Meehl, 1955).

## The Data Fidelity

The measurement theory in survey methodology identifies reliability as an essential attribute of the survey instrument: "the ability of the instrument to generate approximately similar results when the unit of time in which the same observed phenomenon varies" (Mauceri, 2003, p. 56). According to Philips, "an instrument is reliable if it always produces the same results when applied to the same phenomenon" (1971, p. 85). These definitions point to the assessment that reliability relates to the instrument's stability and the measurement's precision (Frey, 1970, p. 244).

The most widely used technique for assessing reliability is test-retest. First, the researcher administers the instrument at time one and codes the responses transformed into a vector. Then the same instrument is administered at time two, at the same place, in the same modes, and to the same subjects, and the new responses become a new vector. Finally, the test-retest reliability coefficient compares the two vectors. However, test-retest reliability's weakness lies in the test's product: a correlation coefficient is a scalar number, a permanent instrument attribute. Instead, the product of the test should be a vector value that captures the reliability of each subject's responses over the two administrations, but the final coefficient condenses all scores into a single number, eliminating inter-individual differences (Marradi, 1990). Furthermore, nothing guarantees the homogeneity of the stimuli administered in times one and two, and "subjects may have perceived the stimulus differently in the two administrations" because the conditions of the second administration can change (Pitrone, 1984, p. 83).

Another procedure for assessing the instrument reliability is the parallel forms, deployed to isolate the timing factor: the researcher administers two different and equivalent versions of the same instrument to the same subjects in times one and two. Then the correlation coefficient between the two vectors is calculated to estimate the instrument's reliability. However, parallel forms are not immune to criticism. Indeed, changes in the subjects' state on the property under investigation can occur in the interval period. Moreover, the most significant difficulty lies in constructing two real equivalent instruments. As an alternative to the parallel forms, the split-half method involves administering an instrument simultaneously to one sample of subjects. First, the researcher splits the instrument into two equivalents halves. Then, after collecting the responses, the correlation coefficient between the two halves of the test is calculated. The more significant the correlation between the scores in the two halves of the instrument is, the greater its reliability. The main problem is deciding how many items to include in the test and dividing them between the two groups (Carmines & Zeller, 1979).

This conception of reliability and the procedures designed to measure it assume that the state of the object does not change spontaneously in the interval between observations; the observation process does not alter the object's state; differences between objects of the same type are insignificant. These assumptions are questionable and replaceable with the new following ones: the state of a human subject can change spontaneously between subsequent observations; the observation process can alter the object's state or record one even where none exists; finally, differences between individuals, including the observer, and every difference between observations situations are relevant. These considerations keep with the nature of the social sciences and emphasise the necessity of finding a new term that fills the semantic void left by the traditional definition of reliability as a property of the measuring instrument. The concept of data fidelity replaces reliability because it lies at the level produced by the individual act of survey observation. "It is a question of judging how faithfully that data, taking into account the conventions introduced by the operational definition, corresponds to the supposed actual state of a subject on the property. Such control makes it possible to correct mismatched data, thus improving the survey data quality" (Marradi, 1990, p. 81). Fidelity is "the property of the relationship between the concept that suggested the operational definition and the actual outcomes of the operations that that definition provides" (Marradi, 2002, p. 82). However, various causes can distort the fidelity of the data. For example, if the interviewees are not interested in the questionnaire topics, the subject would use elements provided by the interview circumstance to create an opinion at the moment or answer at random (Cicourel, 1964; Sargent, 1945; Thurstone, 1922). Social desirability is the most dangerous source of bias for data fidelity: respondents answer by lying to avoid giving an image of themselves made up of "socially undesirable traits or characteristics" (Philips & Clancy, 1972, p. 925). This phenomenon occurs when the interviewee responds about behaviours and opinions that openly violate general social norms,

considered by the collectivity to conflict with the fundamental principles of the society. Therefore, the interviewee does not hesitate to lie; "left alone with his incompetence he tends to give official answers... in tune with commonly accepted prevailing ideas... very different from those he expresses in private" (Przybylowska & Kistelsky, 1982, p. 115).

By introducing the concept of data fidelity, the scientific community returns the focus on information-gathering instruments, which do not photograph reality but can only record it more or less accurately. To control the fidelity of the collected data, the social survey researcher looks outside the matrix and sets up a series of procedures to compare the respondent's answer with the actual state of that subject on the property.

## The Semantic Standardisation of the Interview

In the behaviourist tradition, comparability of responses is the main goal to be achieved following the standardisation rules, rigidly controlling the behaviours of interviewers and respondents. This idea establishes the link between stimulus invariance and response comparability, a factor that should ensure data quality (Fowler, 2009).

Lazarsfeld is the most influential scholar to have criticised the dogma of stimulus invariance, attempting to take sociology out of the positivist restrictions. He realised that investigating the why of human action is an art, a blend of wisdom and creativity. Unlike the measurement theory, the scholar emphasises the interview's relational character. The interview has a pronounced interactive character in which communicative and interpretive complex processes act. For this reason, rigid standardised practices cannot guide the behaviour of the interviewer and the interviewee. Lazarsfeld advised not to seek standardisation of stimuli but the uniformity of meanings transmitted during the interview. In his famous article The Art of Asking Why, Lazarsfeld (1935/2001, p. 33) writes, "it is far more important that a question should have a precise meaning than a precise wording". In line with this thought, the social researcher follows three principles in drafting the questionnaire:

-the principle of specification. The survey researcher chooses the main semantic dimensions to guide the formulation of questionnaire questions. In doing so, the researcher identifies the aspects important for the object under investigation and then formulates a question for each aspect. If the researcher allows respondents to answer according to their inclinations, each subject answers according to the most salient and accessible elements. On the contrary, "the questionnaire must be designed to make the researcher's cognitive interests clear and uniform to the respondents" (Pitrone, 1999, p. 218);

-the principle of explication of tacit assumptions. There is a mutual and tacit understanding between the interviewer and the respondent that some obvious information should not be made explicit but disregarded during the interview. This agreement, commonly found in ordinary conversation, shifts the focus to the role of tacit knowledge, that is, "that wealth of knowledge the human mind possesses and uses to guide actions and behaviour" (Marradi, 2003, p. 321). Nevertheless, while the everyday context offers all the elements to manage the interaction and correctly interpret the implicit information, the interview context is very compressed and unusual for the interviewee. The researcher must clarify the information relevant to the cognitive objective through a series of questions, which operationally define the properties chosen to fix the different articulations of the general concept;

-the principle of differentiation. Lazarsfeld's central thought is that questionnaire questions have to be formulated in a way that "each respondent is in the position to answer" (Lazarsfeld, 1935/2001, p. 37), adapting the questions to the experience of the subjects and to the conceptual schemes through which the people interpret the asked question. In contrast to behaviourist thinking, Lazarsfeld (1935/2001, p. 38)

argues the need to move from formal to substantive standardization: adapting the wording of questions to the respondent means shifting the focus from observable behaviour to issues of meaning.

Lazarsfeld understood that variability in the way interviewers ask the question is essential for a good interview rather than a problem to be solved through formal standardisation. Consequently, a questionnaire should be a flexible instrument, allowing the interviewer to make appropriate modifications. The shift from formal to semantic standardisation has often turned out to be only intent but poorly practised. Few scholars have engaged in the attempt to abandon the myth of formal standardisation. From the empirical evidence, such a shift valorises a new type of interview, the so-called conversational interviewing (Schober & Conrad, 1997).

The conversational interview is the only form of interviewing that, although standardised, grounds the standardisation on the meanings and not on the behaviours. The conversational interview is a soft version of the standardised interview; this softness lies in the realisation that the behaviourist aspiration for formulating the perfect question is only an unattainable and counterproductive chimaera (Gobo, 1997). The interviewer is the key to good quality data in a survey to avoid dangerous events of respondent misunderstanding and misinterpretation that would distort the data collected during the interview. From this point of view, "the interviewer is not simply a passive subject to be trained but assumes the competence to instruct the interviewee to adequately perform the required tasks and support him/her in case of difficulty" (Mauceri, 2003, p. 133). The conversational interview allows the interviewee to interpret the question consistently with the researcher's expectations, enabling both interviewer and respondent to cooperate to achieve complete semantic intersubjective congruence. There is the intersubjective congruence of the meanings transmitted by the interview when different respondents interpret the exact text and category alternatives question, following the meanings attributed by the researcher.

## SOLUTIONS AND RECOMMENDATIONS

### Pretest for Data Quality

The pretest is the phase of research deputed to control the proper functioning of the entire questionnaire before the survey starts. The pretesting includes a set of procedures to control the instrument's goodness constructed by the researcher (Selltiz & Jahoda, 1963). The researcher must determine this assessment before the instrument is used in a survey rather than later. Indeed, the probability of obtaining good-quality data is minimal if a survey questionnaire is flawed.

The pretest is also functional as a moment in the more general data quality-controlled design, by which the researcher arranges "a series of procedural expediencies that fit appropriately within the overall process of data construction to reduce the risks of bias significantly" (Mauceri, 2003, p. 161). In this view, pretesting is when the survey researcher seeks empirical feedback on the correctness of the choices made up to that point. If the researcher does not set up the best possible pretesting procedures to control the data quality ex-ante, later, he/she must control data quality within the matrix through procedures ex-post (Liani & Martire, 2017).

In summary, the pretest provides the appropriate tools for achieving data quality (Presser et al., 2004) in its dimensions:

- ensuring the conceptualisation of the survey problem: the pretest consents to understand whether or not specific properties are relevant or irrelevant aspects to put in the conceptual map;

- controlling the validity of indicators: the pretest determines the validity of those property concepts which, it is assumed, are good indicators of the general concept;
- enhancing the level of data fidelity: the pretest identifies those factors that inhibit the respondents' sincerity. For example, it helps to find the questions formulated in such a way as to favour socially desirable answers;
- guaranteeing congruence in the transmission of meanings: the pretest controls the accuracy of the respondents' interpretive processes to ensure that they understand the questions in line with the researcher's expectations.

## CONCLUSION

The quality of data in social survey research comprises numerous operational dimensions that recall the constant intervention of the researcher in all phases of the survey. The researcher, attentive to the data quality topic, designs an overall research design capable of answering the general research questions. The chapter's authors explore two perspectives on the conceptualization and operationalization of data quality in survey research, which refer to opposing methodological and epistemological paradigms. In particular, the pragmatist perspective is illustrated. It rejects the objectivist view of data quality and the idea that quantitative social survey research must make objective photography of reality. Instead, the survey is a scientific activity that assumes centrality when it builds quality research data, able to respond to the researcher's cognitive aims because they make up an empirical basis suitable for achieving the research objectives. The pragmatist paradigm enhances four quality dimensions, which value the research activity rather than the investigated object. The dimensions of the survey research quality cross the entire survey research path:

- selecting the properties relevant to the investigation;
- identifying the valid indicators of the isolated concepts;
- implementing effective procedures for designing the data fidelity;
- transmitting uniform meanings to the interviewees consistently with the conceptual schemes of the researcher in the data collection phase.

Finally, the usefulness of the pretest is highlighted as a research strategy that helps to design the data quality in a controlled manner before data are distorted by the administration acts in the field.

Paying due attention to the data quality construction process is relevant not only for quantitative social scientists but also for those who use these data in the information society; that is, the potential stakeholders use survey data for various purposes. We are primarily talking about those who occupy positions of responsibility in the public life of a country, taking public governance decisions based on data that experts provide employing the survey. The survey data provided by the experts to the public decision-maker can be employed to plan and implement public policy programs that impact people's lives. One example is the Labour Force Survey that Istat (the Italian Institute of Statistics) carries out continuously (monthly updated) to offer the Italian government valuable and updated information on the labour market, for example, on employment and unemployment rates in Italy. In this case, the survey data assumes public relevance, and the quality with which the data are constructed also has an evident public relevance. Data quality is usually guaranteed when well-known and prestigious statistical institutes conduct survey research. However, it is always worth asking whether the data used as a foundation for

public policy choices fully mirrors the data quality criteria illustrated by this chapter. Data quality is an ethical issue that most closely affects the survey research and the community's life.

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## KEY TERMS AND DEFINITIONS

**Conceptual Map:** Net or flowchart in which all the research concepts are linked via arrows and organised, to help the researcher clarify the relevant research proprieties.

**Conversational Interview:** The research interview that enables the interviewer and interviewee to cooperate mutually, to achieve inter-congruence of meanings coherently to the researcher's cognitive schemes.

**Data Fidelity:** Correspondence between the property that suggested the operational definition and the actual information collected and registered by that operational definition.

**Data Quality:** The multidimensional principle of survey research that indicates the capacity of the collected and analysed data to respond coherently to the research questions.

**Formal Standardisation:** Exposing all respondents to the same questions and response alternatives, assigning a value to the answers to interpret the differences between respondents.

**Questionnaire Pretest:** Phase of survey research designed to test the proper functioning of the research instruments and the other data quality dimensions.

**Response Accuracy:** Correspondence and coherence grade of the respondent's answers according to the cognitive sense of the researcher's question.

**Semantic: Standardisation:** Exposing all respondents to the same meanings transmitted through the questions and response alternatives during the survey interview.

**Social Desirability:** Respondents' tendency to provide answers congruent with social norms belonging to the reference group, to provide the best self-image while lying.

**Validity:** The property of the relationship between a specific concept that suggests the operational definition (the indicator) and the too-general concept that does not suggest a direct operational definition.

## ENDNOTE

[1] This chapter is a joint work by the two authors. However, in line with standard academic practice, we indicate that Marco Palmieri wrote the paragraph "Focus of the chapter. Data quality dimensions in survey research"; Rosario Aprile wrote the introduction, the paragraphs "Theoretical background", "Solutions and Recommendations. Pretest for data quality" and the conclusion. All authors have read and agreed to the published version of the manuscript.