Validity and Reliability of Observation and Data Collection in Biographical Research

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Validity and reliability of observation and data collection in biographical research

Summary
The role of biographical research in the medical and health sciences has often been criticized. One of the main reasons for this critical approach derives from problems with the validity and reliability of observations and interpretations of biographical material. In this publication we present a number of procedures which can guarantee the validity and reliability of biographical research. Separate procedures are proposed for the observation and the interpretation processes.

"The role of measurements in the development of theoretical sociology should not be exaggerated. Comparatively few theoretical advances in other sciences seem to have been inspired by refined measurement techniques and I cannot think of any existing sociological proposition that owes its existence and plausibility primarily to a careful control of the errors of measurement." Zetterberg (1965:165)

1. Introduction

In the medical and health sciences one is mostly rather critical towards the results of biographical research. Partly this criticism is due to underlying conflicting views about science (collision of paradigms), but partly also to the actual performed practice of biographical research. One can easily say that a lot of "biographical" research still remains in a pre-scientific phase. It is often looked at as amateurish and impressionistic and it would be helped with a more professional and methodologically based approach.

1 In a number of publications we have copiously paid attention to this problem (Lafaille 1992; Lafaille and Meys 1987; Lafaille and Fulder 1993). The lack of recognition of multi-interpretability of reality leads to a lot of false problems in science (see Gurvitch's notion of "des faux problèmes"; Gurvitch 1962).

2 A lot of medical magazines supply a lot of examples: quickly redacted case studies which show the success of some kind of therapeutic intervention. In all these reports observation, interpretation and description are mingled. Moreover they are not suitable for verification by third parties. A perfect example of basic intuitions, that got out of hand through a lack of an adequate biographical methodology, is Freuds pansexism. Also the more recent studies in psycho-analysis have not been able to substructure their hypotheses, partly because not enough attention has been paid to methodological issues. With all respect for psycho-analysis, some of its critics are right. Without any empirical systematic it leads very easily to a circular belief-system.
In this article we shall focus on the validity and reliability of biographical research and restrict ourselves further to the process of observation and data collection. Validity and reliability are crucial themes in the development of a more adequate methodology for biographical research. We will systematically explore the topics and problems with regard to this theme as well as suggest procedures that enhance the validity and reliability. We will specifically aim our attention at the biographical method in the health sciences. This limitation implies that alternatives are left open and that one can put different emphases in other fields of applications.

To locate the theme of this article explicitly, we shall describe briefly the biographical method and its purposes. Before we draw attention to the specific methodological themes, it is necessary to unfold a number of more common conceptions of science and scientific character.

2. The biographical method: definition and potential for the health sciences

Biographical research (or BR) aims to investigate the biography of a person and the related life processes by means of scientific methods. The term “life processes” refers to the unique, inner, psychological and transpersonal development of a person in relation to the complexity of interaction with the different contexts in which s/he lives or lived: social environment, work relationships, ecological environment, family, etc. A biography reflects this very well. Scientific reconstructions of the life cycle are made, mainly on the basis of verbal information given by the person being studied. Nevertheless, personal documents such as diaries, written biographies, letters, films and videos might be used too. For the health sciences, scientific reconstructions of the life cycle are very important. They can be used for a wide range of purposes and to test a large number of hypotheses. As a method for empirical research, BR is theoretically neutral. It can be used in combination with a lot of theoretical perspectives on life processes such as psycho-analysis, phenomenology, symbolic interactionism, personality models of developmental psychology, etc.

Biographical research is a kind of interpretative research. It deals with interpretations

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1 In other publications we have worked out a number of aspects with regard to the biographical method: definition and types of biographical research (Lafaille & Lebeer 1991), the difference between observation and interpretation (Lafaille, Lebeer & Mielants 1995) and the practical implications for actual research (Lafaille & Lebeer 1992), an overview of recently developed theoretical models in some therapeutical traditions (Lafaille, Lebeer & Tilkin-Franssens 1996) and a proposal for integration of theories on a meta-level (Lafaille 1996).
at different levels (Lafaille, Lebeer & Mielants 1995) which are simultaneously present in reality:

- The person him/herself is continually interpreting and permanently re-interpreting the events of his/her life.
- The person is also interpreting the behaviour of others and the relationship to his own behaviour.
- The researcher is interpreting the information the person entrusted to him.
- The researcher is interpreting patterns in the biography in accordance to a theoretical frame of reference.

In biographical research the communication is, in contrast to quantitative research, very large and intensive. On the one hand, there is much more feed-back (possible) between the researcher and the subject of his/her research; on the other hand, there is much more chance of influencing the interviewee. Biographical research is very well suited to study life processes and individual development. It is a kind of historical and generic approach. Biographical research is a suitable instrument for studying inner development, existential problems and emotional issues. The special features of biographical research and its specials problems of research demand an appropriate method.

Biographical research can help to clarify a lot of questions in the health sciences. We only mention two here: (a) Is there a relationship between characteristics/patterns of a biography and health parameters (longevity, well-being, somatic functions, vitality, etc.)? and (b) Is it possible to change the health parameters of people by health technologies (such as healthy life style, meditation, re-definition of life processes, etc.) and choosing another path in life? Contemporary research in the human sciences, psychosomatic medicine and psychotherapy points in the direction of a close relationship between inner development and health and/or illness.
3. Epistemological foundation

In the literature we find heated discussions about the scientific status of biographical research, or more in general about the advantages and disadvantages of quantitative and qualitative research. Part of this discussion is due to underlying conflicting views about science. This discussion is not an easy one, and one can doubt if it will ever lead to a satisfying answer. Nevertheless, it is our opinion that one can discuss this more appropriately if some traditional ideas are widened and if the discussion is partly carried out on a meta-level (Lafaille 1996). Another reason for the divergence of opinions is a lack of epistemological reflection and the one-sided focus on certain moments in the process of gaining knowledge (e.g. theory building against creativity or testing against explorative research).

To deal adequately with the problems of validity and reliability, we will first present a broadened concept of science (3.1.). This implies a connection with major epistemological positions (3.2.). Here we deviate from the classical methodology text books, which dominantly deal with these topics in exclusively operational terms. Last, but not least, we will try to integrate into the epistemological process an almost forgotten aspect, the creativity process in scientific research (3.3.).

3.1. What is science?

Science aims at a systematic and logical reconstruction of empirical reality.

*Systematic* is a fundamental characteristic of science. It concerns the way of gaining insight, the explicitation of knowledge, the way in which the empirical cycle is carried out as well as the way in which the reconstruction takes place.

*Requirement of logic.* Besides logical ones, also literary and pictorial reconstructions of reality are possible. They are not considered to be scientific, although they may have a deep impact on science. Rational formulation is a formal criterion of science.

*Reconstruction.* This implies a difference between image and reality: they are not simply identical. Science is directed towards theory construction and uses this in further investigations.

*Empirical reality.* Science limits itself to observational realities. Empirical methods are necessary tools to attune facts and theories as much as possible.

Clearly, science is also a pluralistic phenomenon. We subscribe to a multi-

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1 For an overview, see e.g. Lamnek (1988) Linschoten (1964), Swanborn and Van Zijl (1984), Swanborn (1990) and Van IJzerdoorn (1988).

2 For a discussion about the underlying world views in the health sciences, see Lafaille & Fulder (1993) and Lafaille (1992)
paradigmatic view and accept the multi-interpretability of reality. This implies that different interpretations of reality might co-exist, each with its own (in space and time limited) validity and legitimacy. Empirical research is not sufficient to give a definitive answer about opposite interpretations. The reasons why it cannot are practical and technical, but it also follows from an essential feature of our epistemological relationship to reality. For biographical research such a point of view has far reaching consequences (see below).

The requirement of systematic confrontation with empirical reality is crucial. The aim is empirical verification and falsification. This does not mean that these criteria can be used in a reversed order, and that one is allowed to proclaim that only observations are valid if they are falsifiable or if they can be subjected to procedures of falsification. This would exclude the scientific investigation of historical and more generally, unique processes. Maybe it is more appropriate to treat these methodological requirements as concrete scientific utopias, and not as ultimate criteria of validity (see Lafaille & Meys 1987). At least this would facilitate the position of less conventional styles of research such as biographical research.

So far, we discussed the essentials of a modern concept of science which gives room to biographical research. The modern human sciences developed a series of methodological insights which we prefer the treat as postulates. One of them is the requirement of statistical testing. Certainly, such a requirement is something to strive for insofar as the subject matter of the investigation allows it. There are many scientific topics in the human sciences where such a postulate is inappropriate. E.g. the Watergate case can, according to our definition of science, be reconstructed in a scientific way, although nothing can be tested in the classical statistical sense, neither can one prove with classical methods the hypothesis of political manipulation as its background. As other postulates we can mention: predictability, universal laws, generalizability, etc. For biographical research it is necessary to put these requirements of methodology into perspective and to relate them to the subject matter of the scientific investigation.

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1 In the classical sense of Euclides, a postulate is a starting-point that one can accept or reject. This is in contrast with axioms which can only be accepted (Callebaut 1991). In this article, we try to reformulate the axiomatic space of the social sciences in such a way that a significant position can be claimed for biographical research. Biographical research does not have to be competitive with specific postulates which can be seen as spaces with special qualities (just like different types of geometric space). Moreover the social sciences in general, and biographical research specifically, will be helped with a certain form of axiomatisation (see Lafaille 1996).
3.2. Fundamental concepts

In classical epistemology and especially in the theoretical tradition of critical realism as founded by Aristotle and Thomas of Aquinas, truth refers to the congruence of thinking and reality. Famous is the quotation of Thomas (although to a large extent similar to the Aristotle’s position, see Thomas 1920) “Cum enim veritas sit aedequatio intellectus et rei secundum quod intellectus dicit esse quod est vel non esse quod non est, ... “ (Summa contra Gentiles, I59). In the realistic tradition, and this is the brilliant innovation of Aristotle, truth is no longer a characteristic of the object (like the antique philosophers proposed), but of the relationship itself between subject and object, between a judgement and the object to what it refers (Klaus 1975).

Under the influence of neo-Kantian idealism and empiricism, it became usage speaking of validity instead of truth. The concept of validity stems from logic and refers to “the characteristic of an inference whose conclusions must be true if its premises are” (Berg 1992: 104). With the use of the term “validity” instead of “truth” every reference to transcendent realities is avoided. Science limits itself to what can be observed by the senses. The term “validity” also highlights that:
- theoretical concepts have only a limited range of applicability, and are related to specific contexts. The notion of truth refers too much to universalia;
- all our knowledge has constitutive value, and thus doesn’t reflect reality in a simple manner;
- that the “truth of a theoretical insight has to be evaluated in relationship to other scientific notions (Cf. contemporary philosophy of language, constructivism and the epistemological coherence theory); and/or by justification processes within the scientific community or a democratic dialogue between all people involved.

Certainty, on the other hand, is more of a “psychological” category. It is agreeing with a sentence or a judgement, without any fear that this would be wrong (Vander Kerken 1964). Certainty is knowing that something is true, a knowledge that is not based on a subjective feeling of assurance, but founded in objective insight. Traditionally, certainty has been further classified into three types, each representing another degree of assurance: metaphysical, physical and moral certainties. Through the development of the quantitative methodology (survey research, statistical tests, etc.) it became usage to speaking of reliability as a major category instead of certainty.

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1 We will systematically use the following distinctions:
- epistemology = the philosophical theory (science) of knowledge;
- methodology = the theory (science) of valid knowledge in the human sciences and the methods/techniques employed to reach this.
In the methodology of the human sciences, the concepts of truth-certainty are replaced by those of validity and reliability. This shift implies focusing on the specific problems of scientific research. However, this leads too easily to a reduction of the problematic nature of validity in terms of congruence with reality to the validity and reliability of measurements (indicators and scales). This is reflected in definitions like this "...a measurement has a perfect validity if its application does not cause bias. This means that the observed value, as measured by the instrument corresponds precisely with the theoretically intended, true score." (Hagenaars s.d. ; a quite identical definition can be found in Saris & Stronkhorst 1984).

3.3. Towards a new, creative methodology

There is a notable lack of investigation into and reflection on creativity in research processes. These themes are predominantly left out of the scientific discourse. In our opinion erroneously. First of all, there is the principal argument that one of the major forces in science is thus treated as a non-scientific event, which is quite contradictory for an empirical science. Secondly, one has to warn that such an attitude leaves unutilized important opportunities to deepen our insight into certain epistemological

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1 This especially applies to quantitative methodological researchers who, in general, are unfamiliar with creativity. This is strange as they are contributing to a mystification of creative power. All this is in sharp contrast with the universal starting-points of the empirical tradition. A typical example is the following statement by Segers "Strictly speaking one has to give space to the "genius thought" of the researcher in the phase of the formation of hypotheses [...]. Therefore it is for the best that the question 'how hypotheses can be constructed' is left open."(Segers 1983: 72). In this in Holland well-known text-book, creative processes are not dealt with. Moreover with this he stays in the line of the tradition of De Groot (1961). This kind of argumentation is being clothed with a semblance of wisdom whilst this, in our view, must be seen as a sign of incapability because they do not succeed in an integration of these "elusive" elements in their methodology. Such a dualism between creativeness and rationality can be disastrous for the social sciences. It produces a rigid methodological belief system whose only purpose is the maximisation of certainty by testing through quantitative methods.
and methodological problems. E.g. it is certainly possible to get scientific insight in creativity processes by using mediation as an instrument of observation. There is a whole series of mediation exercises which offer opportunities to investigate these processes, even partly with experimental methods.

Consciousness can be subdivided into three types of mind:
1. **The logical mind.** Is directed to the world of concrete objects. Thinking in dualisms in accordance with the discrete things in reality. Installs a relationship with the world.
2. **The reflective mind.** Directed towards self-understanding. Including understanding emotions, body sensations, etc. Thinking in symbols. Establishes a relationship with one’s own consciousness.
3. **The creative spirit.** Directed toward the unknown. Is able to hold paradoxes, contradictions and apparent absurdities, metaphors, etc. in the mind. Establishes a relationship with the unknown, with what people don't know.

Creativity is a process of consciousness. It implies the letting go of old concepts and ideas, and allowing intuition and imagery. Part of the creativity process is reaching a point of tension, which may be accompanied by fears and anxiety. This appears during the act of penetrating the unknown. After that point new ideas, images, symbols might appear. They can be used to construct new (scientific) theories. These new scientific mental constructs are then a rational (re)formulation and logical elaboration of the (new) emerging mental images.

If we will fully accept creativity as a constituent part of scientific endeavours, then we can distinguish four moments in the process of developing notions and ideas in sciences:

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1. It is a pity that this has not happened so far. A number of reasons could be held responsible for this. The main obstacle seems to be a taboo that rests on energetic and emotional phenomena, including meditation. According to our information, research projects in this area have no real chance for getting scientific funds. Probably the main reason for this is that the influence of the mechanistic worldview, from which all current criteria of science are derived, is too dominant. Innovating views which are obtained by using other paradigms meet with a lack of resources so that systematic research has not yet been possible. In this respect a rigid orthodoxy blocks developments.

2. This classifications stems from psychosynthesis. The worldview of psychosynthesis distinguishes between the receptive, meditative consciousness (called the "spirit") and the "mind". We will adhere to this terminology here. The same reasoning will still be standing when, seen from a more classical view of man, each aspect of this threefold distinction is included in the mind. We are not able to discuss here the specific manview of psychosynthesis (see Assagioli 1965, Ferrucci 1982, Hardy 1987). Besides, for our purposes here it is unnecessary.
The four stages of this process have to be treated as *dialectical moments*. In dialectical philosophy one defines a moment as “a special aspect of a whole, in which the whole is present” (Vander Kerken 1964). These main moments are all essential for the development of scientific knowledge and are fundamentally of *equal value* because no moment can exist without the other ones. A common failure (maybe it is even better to speak here of "des faux problèmes" in the sense of Gurvitch 1962) is to treat separated moments as standards for scientific research. Another common failure is the view that all these moments have to be maximalised in every single research. This is quite an unrealistic claim in terms of time and expertise, qualifications of researchers and a misunderstanding about how science actually develops. It seems to be more appropriate not to look at singular research efforts, but to look at research as a collective enterprise, in which various research projects (whether competing with each other or not) follow each other in order to investigate a certain problem or subject matter in a scientifically appropriate manner. At the beginning of this process, one will focus on creativity and the development of concepts and ideas about the problem. After a certain degree of saturation, systematic proving will come to the foreground. If one uses such a process-oriented view of the development of scientific knowledge more, more understanding and reward will come for the trial- and error-strategy of much of biographical research. This may lead to a revaluation of certain methods, like case studies or analytical induction, as adequate research strategies in the stages of creativity.

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1. For example: "Only knowledge which has been tested is (really) scientific" or "Science is not possible without having a theory before one collects empirical data". Such extreme sentences often prevent an organic growth of knowledge. If seen as scientific standards they become counter-productive.

2. Blumer's preference for "sensitizing concepts" can be approached more positive if seen as instruments in a creative process, instead of concepts in contrast with what he calls in an unnecessary dualistic way "definitive concepts". "Definitive concepts" are notions which exactly indicate the common aspects of a certain class of objects. According to Blumer they belong to the field of natural science. "Sensitizing concepts" are referring notions which withdraw themselves from an exact definition.
In the literature, one very often opposes creativity and proving (see for example the discussions between phenomenologists and quantitatively oriented methodologists). Therefore, we will expand somehow further. Creativity aims to penetrate into the unknown. This leads to the formulation of a theoretical concept or theory. Testing, on the other hand, is a procedure to investigate systematically if this concept or theory is in congruence with reality. It is important to stress in a logical sense proving and testing comes after the creative act of defining concepts. Therefore, giving a higher priority to proving and testing is peculiar because the one builds further on the other.

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1 Zetterberg illustrates this with an excellent example from history: “When the law of falling bodies was demonstrated by our physics teacher, he used various materials - stones, metals, wood, cloth and cotton - to show that they all fell equally fast in a near-vacuum. He did not take representative samples of all these materials, but chose a wide scope for the population of material - the scope ranging from metal to cotton. Galileo, who first proved the hypothesis, proceeded in the same way, disregarding representativeness in favor of the scope of the population. To our knowledge, he has never been blamed for this” (Zetterberg 1965: 130).
Both moments can be characterized as follows:

<table>
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<tr>
<th>Dominant brain functions</th>
<th>Creativity</th>
<th>Proving &amp; Testing</th>
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<tr>
<td>Uses right side of the brain: non-verbal, holistic, synthetic, integrative processing of information, uses images and symbols, visuo-spatial, intuitive, timeless and diffuse.</td>
<td>Uses left side of the brain: verbal, sequential processing of information, rational, reductive-into-parts, time-orientated, discontinuous, language, logic.</td>
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| Organisation principle of the process of collecting information | Chaotic (= maximalisation of collecting information from various directions). | Systematic (maximalisation of collecting information within an apriori defined frame). |

| Dominant quality of consciousness | Creative spirit, Intuition. | Logical mind. |

| Dominant epistemological orientation | Oriented towards new ideas and insights (truth/validity) | Oriented towards certainty (reliability). |

Table 1 - Difference between creativity and proving and testing

As has been explained above, both moments can rarely be maximalised in one single investigation: to maximalise the one often goes at the expense of the other. Both kinds

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1 Here we use the terms left and right side of the brain, not in the sense of a specific neurophysiological theory of the brain, but more in a general meaning. This implies that there are fundamental differences between the information processing that can be described with a bipartition. We do not intend to describe exact neurophysiological mechanisms. In this field there is still a lot unknown.

2 A similar situation of communicating vessels occurs in the discussion with regard to the relation between validity and reliability. Researchers generally are convinced that there exists a negative correlation between the level of reliability and the level of validity (Boesjes-Hommes 1970: 65). With regard to this matter Gadourek (1967: 17) gives an overview of the differences between the open interview and the standardised interview (see elsewhere in the text). In his work "Documents of Life" Plummer makes the following remark: "In life history research these two issues have been rarely discussed, perhaps because the problem of reliability is very hard to tap. Given that usually the
of research demand other qualities of consciousness (see Table 1), personality traits and biographical processes of the researcher himself.

Finally, we want to refer to Elias (1978), who rightly stated that methods and theories about a research subject are fundamentally interrelated. For the biographical methodology this statement has far-reaching consequences. In the human sciences, under the influence of the dominance of quantitative methods, a soft dualism emerged that cut up the necessary dialectic between theory and method and used (the quantitative) method as a norm. This led to an extreme focusing on certainty, at the expense of striving for adequate theories and the development of new insights. It is a reversal of a fundamental dynamic. Innovation gets hampered.

For biographical research this means that its method has to be developed in close connection to the development of hypotheses. This is especially needed for the development of these fields which traditionally belong to what is called the “unconscious”. In the past too little has been invested in this field which has led to too speculative theories about the unconscious, on the one hand, and to an erroneous rejection of this kind of research by some (quantitative) methodologists, on the other hand. Biographical research is a field which to a large extent has yet to be developed.

4. Definition of validity and reliability

One could define valid and reliable knowledge as the aim all science is striving for. More problems appear when one wants to describe what valid and reliable statements are and how this kind of knowledge can be reached: "Few concepts have been so confused and have caused so much mischief", observes House (1980: 85). Many other authors complain about a lack of clarity. Four remarks have to made here. If one wants to reach clarity in this field, one has first of all to start with defining these concepts within the context of an explicit epistemology (see 3). Secondly, one will

virtue of life histories lies in the relatively free flowing babble of talk, to attempt standardisation of questionnaires is to invite invalidity. But without such standardisation and crosschecking, attacks become easy” (Plummer 1983: 101).

Note the following passage: “The attempts to determine a certain method as the conclusive criterion of a scientific character, do not reach the heart of the matter... In general systematic observations only acquire meaning and value as a means to obtain knowledge, if they fit in a habit of thought according to which the making of systematic observations is a useful way of unlocking a certain area. In the same way the division between method and theory is based on an error of thought. If one digs deep enough, it will appear that the development of the theoretical notion that people make of an object that they want to know, and the development of the method of research, cannot be separated” (Elias 1978)
have to distinguish the different levels to which these concepts are related. Thirdly, especially on behalf of biographical research, one has to distinguish clearly between three different concepts: validity, reliability and generalizability. And not two - validity and reliability - as is commonly done in methodology textbooks. If one does not do this, as a consequence of a certain kind of logic, one has to exclude certain interesting forms of biographical research from science.Fourthly, one has to be aware of the dialectical character of these concepts. This also affects the way in which one has to think about the interrelations between these concepts.

4.1. Validity

Validity is a term which can be applied to a lot of phenomena. In its most general form, it can apply to a complete study and even to a whole theory and all its related empirical investigations. The conceptual confusion about these terms largely stems from a lack of clarity about which part of the research process these terms relate to and about the reasons for choosing a certain kind of conceptualisation. Also the narrowing down of observation to quantitative measurement causes a lot of unnecessary problems (see the many discussions about the meaningfulness/criticism of biographical research in the literature).

It is important to be aware that concepts cannot be defined in a separate, autonomous space, but that they are embedded in a whole universe of conceptions, notions, explicit or implicit interrelations with other concepts. One could speak here of a (in BR mostly implicit) frame of reference. We prefer the term “theoretical field” for the frame of reference, within which a concept is defined. This approach evidently has implications for observations and interpretations. Only what has relevance within the context of such a theoretical field, will be observed. This process has been described by De Vos (1981: 138) as follows: “When an observer enters a certain environment and identifies there an event or object, then the result of this act of identification is determined by (1) the schemes used by the observer which are derived from (2) the most directly

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1 Segers ("The notion of validity implies that the research data have such a character that one can move legitimately from the level of the empirical variables to the level of theoretical concepts"; Segers 1983: 187). restricts validity to the consonance between a theoretical field (T) and a field of indicators (I). Hagenaars ("Validity can be described as the degree to which the observed score, as registered by the instrument, corresponds with the theoretically intended, real score. In the most ideal situation the observed score only depends on the real score, but in reality several interfering factors may play a significant role during the measurement"; Hagenaars 1986: 2) focus on the correspondance between a theoretical field and a field of observational, measured data. This is another example of the (unspoken) restriction of the concept of validity to quantitative data.
available categories, although (3) the cognitive chart of the environment implies which categories are available. The cognitive chart can be conceived as the sum total of sentences about the relationship between characteristics of the environment (which the observer expects to find) and the kind of events which will appear in an environment with these characteristics”.

We distinguish in the process of operationalisation the following levels:

![Figure 3. Levels involved in the operationalisation process](image)

In the literature often various aspects are stressed, which causes a lot of unnecessary differences and confusion (these different levels are referred to in Figure 3 by capitals and numbers; references are made in the text)

A distinction between the following four levels is made:
- the theoretical concept (T);
- the indicators, including the formulation of concrete items (I);
- the practice of observation/measurement (M);
- reality (R).

It is important to distinguish the practice of observation as a separate level because it is a potential source of bias.

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1 Operationalisation (also called indicating) is the process of translating the theoretical characteristics of a phenomenon into empirically manageable characteristics. Segers (1983: 133) makes the following distinction: "if one focuses on the translation of a theoretical concept to the empirical field, one speaks of indicating. If, however, one focuses on the way one observes phenomena in social reality, we will talk about operationalisation ". Boesjes-Hommes stresses that operationalisation of concepts always occurs because there is always a difference between the definition of an object (in scientific language) and the rules of observation of reality (the empirical language) (Boesjes-Hommes 1970: 140). The counterpart of a theoretical concept is a variable. "A variable is a characteristic which units of research can possess to a lesser or larger extent” (Janssens 1983: 27). De Groot (1961: 89) speaks of theoretical concepts as intended in the scientific language and empirical variables as given in the empirical language. Operationalised variables of theoretical concepts are called indicators. Indicators are empirical specifications of a dimension of a theoretical concept.
Further is it essential to make a distinction between:

a. the validity of a concept;

b. the validity of a relationship between two or more concepts c.q. the empirical phenomena to which they refer.

Biographical research in the health sciences is mainly directed to discovering in the life history of people latent structures, which influence health and disease. A latent structure can be conceived as a well-defined concept that has to be indicated by concrete data (e.g. unconscious shame). The question of effect refers to the validity of a relationship (c.q. in this case unconscious shame leads to depressed emotions within this person).

Ad a. The validity of a concept can be formally described as follows:

1 In the classic book by Cook & Campbell (1979:37) the distinction between various types of validity is not made systematically enough. Also the categories of validity and generalizability are mixed. They distinguish four kinds of validity:
   2. Internal validity. This refers to the question if a causal relationship between the research data exists: "...refers to the approximate validity with which we infer that a relationship between two variables is causal or that the absence of a relationship implies the absence of cause" (idem: 37)
   3. Construct validity. This refers to the generalizability of concepts: "...refer to the approximate validity with which we can make generalizations about higher-order constructs from research operations" (idem:38).
   4. External validity. This refers to the generalizability of causal relationships: "...refers to the approximate validity with which we can infer that the presumed causal relationship can be generalized to and across alternate measures of the cause and effect and across different types of persons, settings, and times" (idem:37).
(1), (2) en (4) refer dominantly to causal relationships.

2 Classically this is called “content validity”. Synonyms found in the literature are “face-”, “logical-” or “sense validity”.

3 A latent structure means that the structure is supposed to be of a nature which cannot be directly observed, but has to be induced from singular data. This notion as used here, is quite similar to the notion of latent structure or latent variable in scale analysis or regression equations. The difference is that in biographical research the notion also applies to a single case, however based on many data (a large series of answers to questions). Of course, one can also investigate a latent structure behind various cases.
Using the logic of algebraic set theory, the validity of a concept A can be defined as follows. A concept A is valid (i.e. the relationship between a concept/theory and its operationalisation) then and only then when the relationships between T and I and between I and R are bijections, and therefore the composition of these bijections is also a bijection.

The mathematical definition reads as follows:

When there exists an A ⊆ T, B ⊆ T and C ⊆ R we define two bijections
\[ f : A \rightarrow B \quad \text{and} \quad g : B \rightarrow C \Rightarrow g \circ f : A \rightarrow C \]

In its more general form, we can define a valid relationship as:
\[ f : T \rightarrow I \quad \text{and} \quad g : I \rightarrow R \Rightarrow \text{so that } g \circ f : T \rightarrow R \]

Zetterberg (1965: 115) distinguishes five possible congruence/discongruence relationships between concept and indicator. Evidently this can also be applied to the relationship between I and R. These five possibilities are:
1. Perfect validity: concept and indicator are completely congruent.

2. The concept implies the indicator and, in addition, something other than the indicator.

3. The indicator implies the concept and, in addition, something other than the concept.

4. The indicator implies the concept and vice versa.

5. Complete invalidity

The possibilities 2 to 4 represent shortcomings of the validity. In the fifth case one has to do with complete invalidity. Indicator and concept can then later be linked to each other, either by adapting the indicator, or the concept, or both. Further it will not always be possible that an indicator totally covers the universe of the theoretical concept. Then one can for example draw a sample from the definatory field of the
The validity of concepts precedes in a logical sense the validity of the relationships between concepts. Because, if the concepts cannot be operationalised in a valid way, how can the relationship between them then be valid? (However, this argument has not to be treated in an absolute way). E.g. if we suppose that there exist a relationship between cancer and personality traits, we first have to be sure that we observe cancer and personality traits adequately, before we can accept that a valid relationship between them exists.

One can define the validity of relationships by also using algebraic set theory, as shown below:

For 2 sets $A$, $B \subseteq T$ we define a bijection $h : A \rightarrow B$, analogously for $C$, $D \subseteq I$ we define $i : C \rightarrow D$ and for $E$, $F \subseteq R$ we define $j : D \rightarrow F$.

We then define as the validity of a relationship:

$$f(h(A)) = g(i(C)) = j(E)$$

In general we will also have:

$$f : T \rightarrow I \& g : I \rightarrow R \Rightarrow g \circ f : T \rightarrow R$$

We then have $f(A) = C$ and $f(B) = D$, and analogously $g(C) = E$ and $g(D) = F$.

and it then follows that:

$$f(A) = g(D) = E \text{ and } f(B) = g(D) = F$$
As a graph:

![Diagram](image-url)

Figure 5. The relationship between different levels of operationalisation for relationships between different concepts

With the double-pointed arrow in Figure 5 we indicate that the kind of relationship between the concepts might be of a more complex structure than a simple cause-effect relationship. All relationships might be causal, but they might also be of a different nature. In any case one has to be very explicit about the kind of relationship one supposes to exist, and in the case of causal relationships which kind of causal model one adheres to (see Tacq 1981).

Besides one can find in the literature some related terms:

1 A terminological distinction between internal and external validity leads to confusion, because “internal” and “external” are referential categories. It is not always clear what is referred to. This leads to problems which we can illustrate with two quotations which contradict each other:

- Internal validity “…refers to the approximate validity with which we infer that a relationship between two variables is causal or that the absence of a relationship implies the absence of cause” (Cook & Campbell, 1979: 37). Internal validity”…refers to the validity with which statements can be made about whether there is a causal relationship from one variable to another in the form in which the variables are manipulated or measured.” (Cook & Campbell, 1979: 38)

- External validity “…refers to the approximate validity with which we can infer that the presumed causal relationship can be generalized to and across alternate measures of the cause and effect and across different types of persons, settings, and times.” (Cook & Campbell, 1979:37).

• **Criterion validity.** One speaks of criterion validity when a measurement instrument can be evaluated by means of an external variable. Such a variable might be another variable (e.g. a scale) whose validity is already solidly established. In this case one speaks of “congruent validity”. Also one can use “golden standards”. This refers to the example of the golden metre, with whom the precise length of a measuring rod can exactly be controlled. In general in the health sciences there are hardly any variables for which such a golden standard is available.

• **Predictive validity.** This means that the validity can be evaluated by the exactness of predictions of the variable. E.g. a test of school records could be evaluated by its usefulness to predict future occupation. In a certain sense predictive validity can be considered a special case of criterion validity. Predictive validity raises a lot of methodological problems. As a separate form of predictive validity validation through practical application has to be mentioned. Similar methodological problems occur here.

• **Construct validity.** Is a combined form of validity. Establishment of this kind of validity takes place in three steps. First of all, one checks if the operationalisation is adequate with respect to content (just as for singular content validity). Secondly, one examines if the stated relationship between the indicators or items is according to the theory. And finally, one examines the relationships between the operationalised variable and other variables; one checks if the empirically established relationships are congruent with the relationships as worked out in the theory. If this is the case, this can be seen as a proof of the validity, although within certain limits (Hagenaars s.d.).

• **Communicative Validity.** Fuchs defines this term as follows: "Kommunikative Validierung heißt, das die Gültigkeit einer Interpretation oder einer auf Interpretation beruhenden Zusammenstellung von lebensgeschichtlichem Material allein durch Diskussionen und Einigung zwischen Sozialforscher und Befragtem ermittelt werden kann. Die Bearbeitungen der im Interview hergestellten lebensgeschichtlichen Daten durch den Sozialforscher werden gewissermaßen als Vorschläge an den Befragten angesehen. Sie werden unterbreitet; er hat über ihre Stimmigkeit das letzte Wort" (Fuchs 1984: 299). After various interviews, the researcher can determine if he can find patterns within the life story. For that he uses connections between certain concepts. The researcher has to investigate if such meaningful structures can be discovered. The attempt to combine the various biographical events with each other marks the transition from life events to structural characteristics. Biographical research
is mostly focused on the level of structural characteristics.

• **Expert validity.** When one is confronted with very complex issues, one falls back on an evaluation of the overall phenomenon by experts. Intersubjective consensus is then taken as a criterion of validity. In the health sciences this is commonly used to determine the incidence and severity of an illness (“peer judgement”).

• **Known groups validity.** Known distributions of a variable can be taken as a criterion of validity. Especially in the health sciences this is relevant when one takes groups with extremely discriminating values c.q. compare extremely healthy people with extremely ill people according to the variable which indicates certain characteristics of health and illness. The differences ought to have a lot of discriminative power.

• **Argumentative validity.** Explicitation of starting points and systematically reporting of how the researcher comes to certain interpretations and conclusions have to prevent implicit bias and enable a critical reading.

• **Cumulative validity.** This refers to the cumulation of results of research among various investigations and researchers. This kind of validity is especially relevant to the process of observation and interpretation of biographical data (see below).

• Special attention has to be given to **statistical conclusion validity.** Statistics is with respect to the data an external criterion to evaluate the validity of observations, interpretations and interrelations. If observations, interpretations and interrelations suit the current rules of statistics, then one speaks of statistical conclusion validity. Statistical conclusion validity is often a necessary (but not always a sufficient) requirement for other kinds of validity, reliability and generalizability. Statistical conclusions can be threatened by many factors. We will mention some of them here, although this list is not exhaustive: too small samples or failures in the random composition of a sample, lack of statistical power, inappropriate probability levels, violation of statistical assumptions for test procedures or procedures for (multivariate) analysis, statistical artefacts, etc. Also statistics itself can generate failures. For example, statistics can only decide on the basis of probability. These decisions can be wrong because the empirical reality can be different.

• More specific to the background of biographical research, one has to mention **daily life validity** (which Köckeis-Stang 1980 rather confusingly calls “ecological validity”). Biographical data have to be valid in regard to the natural world of daily
living of the interviewee. The interpretations have to be connected to daily life too.

### 4.2. Reliability

In the human sciences reliability has the meaning of observation without systematic bias (Hagenaars, s.d.). Derived from this general definition, it also means stability/reproducibility of the results of a scientific observation (measurement): repeated application of a research instrument upon identical persons have to show identical results. The claim of reliability in quantitative research, of which the survey is the most prominent representative, has led to a quite rigid, fully standardized research structure. It will be clear that such research can be repeated quite easily. Methodologically speaking, we face a specific problem that the reproducibility is partly the result of the standardized research procedures themselves (there is a real danger to create scientific artefacts). This kind of criticism is hardly heard: social and professional norms are more influential here than methodological accuracy.

The flexible structure of biographical research causes a lot more problems regarding reliability than in the case of quantitative research. Kohli summarises them as follows: "Wie mit dem 'ganzen Leben' das man in ausführlichen biographischen Erzählungen vor sich hat, umgegangen werden soll, hat manche Projekte vor unlösbare Probleme gestellt...dabei ist wohl nicht mit einem ebenso hohen Grad von Formalisierbarkeit durch rege richtigen Verfahrens zu rechnen...." (Kohli 1981: 291). On the level of singular data perfect reliability seems to be unfeasible in biographical research (But neither is this the case with a survey. When one asks someone to fill in a questionnaire many times, the answers will never be identical. Real changes, errors, respondent bias, measurement unreliability, acquaintance, adaptation to the expectations of the researcher, etc. are responsible for differences). What is important for biographical research is to determine the occurrence of some “historical” events (such as whether the respondent had brain damage at birth) with a high measure of reliability and the reliable determination of latent biographical structures (see above). The reliability of

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1. In classical quantitative measurement theory validity implies that the following assumptions are met:
   a. the expected value (the average) of the random number equals zero in the long run;
   b. real values and random errors do not correlate;
   c. neither is there a correlation between a random error in a first measurement and a real value in a second measurement;
   d. nor is there a correlation between the random errors of different measurements.

2. To determine the reliability one claims that the real value does not change. This would not always be the case. One has to bear this in mind. When there is a significant flux in real values (such as in the case of emotions) it will not be easy to determine the reliability of an observational instrument (e.g. a questionnaire).
latent biographical structures can be guaranteed by repeated inquiries; and possibly the use of different researchers (see below). Thus the main criterion is not if all details are identical, but if one reaches similar conclusions about latent structures by triangulation (e.g. unsolved emotions about a divorce may cause the low back pain of a patient).

Reliability in biographical research (also a derivation of the general definition; see above) also means: consistency/reproducibility (Lamnek 1988: 160). We will propose below procedures to guarantee consistency between interviewee and researchers. In principle they must also guarantee that the same conclusions from the data will be reproduced when the observations are repeated.

4.3. Generalizability

Generalizability means that the conclusions of an investigation about a limited set of units can be claimed to be applicable to a larger set of units (or a larger encompassing whole or higher system level). This means concretely that the results of an investigation apply to a larger number of cases than those from which they are inferred. The classical conception is that the researcher wants to make conclusions on the basis of a sample which apply to the complete population or universe to which this sample belongs (Janssens 1983: 52). It is evident that one has to describe very clearly what the population is and what the universe to which the population belongs (e.g. a sample of adult Dutchmen might belong to the universe of adults or to the universe of Dutchmen). The term representativeness refers to the same phenomenon, but uses characteristics of the units itself instead of characteristics of the population as its point of reference. These are supposed to be representative if sentences about these units can be generalised.

In our view at least four forms of generalizability have to be distinguished:
<table>
<thead>
<tr>
<th>Generalizability</th>
<th>Testing, and other safeguards to guarantee generalizability</th>
</tr>
</thead>
<tbody>
<tr>
<td>generalizability of the interview data to the life history</td>
<td>representativeness of interview data, careful observations and interpretations, asking for feedback, etc. (representativeness of interview data)</td>
</tr>
<tr>
<td>generalizability of interpretations</td>
<td>observing and interpreting by different researchers (representativeness of researchers)</td>
</tr>
<tr>
<td>generalizability of hypotheses to the population</td>
<td>aselect sampling (statistical representativeness)</td>
</tr>
<tr>
<td>explorative generalizability</td>
<td>no testing: although explicit argumentation is required (strategic representativeness)</td>
</tr>
</tbody>
</table>

Table 2. Forms of generalizability and safeguards to guarantee/test them

1. Generalizability from a (limited set) of interview data to the life history of the patient. If we can conclude from our data set that the patient shows characteristics of a depression, then the question rises if this has always been the case and if therefore one can say e.g. that he has a depressed personality trait. Here we deal with the representativeness of interview data.

2. Generalizability of interpretations. We find an example in biographical research in which different researchers are involved; here one checks if there is congruence between one’s own findings and the findings of other researchers.

3. Generalizability of hypotheses to the population (which is guaranteed by statistical representativeness).
4. Statistical generability especially is important in the stage of testing the hypotheses. In the explorative stage, when the focus lies on the creativity process, one can choose for a fourth form which is called explorative generalizability c.q. strategic representativeness. Strategic representativeness can be used when:

* one is developing (a) new research theme(s).
* one is dealing with research topics for which a high measure of certainty is not very relevant (e.g. the motivation for visiting a pub), or when statistical representativeness is not appropriate or unfeasible (e.g. budget limitations, importance to have results very fast; as in e.g. marketing research).
* testing is not the best strategic option (in the case of cancer research, for example, the testing of the hypothesis of a relationship between this kind of illness and biographical processes would cause research funding for this type of research to dry up, which could cut off the creativity process too early).

Strategic representativeness is deployed for reasons of efficiency and parsimony. And one relates the kind of research to its theoretical and practical importance. Therefore the term “strategic”. One wants to come to results as fast as possible, at reduced costs.

In the health sciences almost all biographical research is still in an explorative stage. Therefore it is important to deal with this kind of representativeness at greater length (see Lafaille, forthcoming). It is important to stress that strategic representativeness reaches far beyond its usage in a single case study.

After one has reached strategic representativeness, one can consider to reach generalizability of interpretations or generalizability towards a complete population in follow-up research (by replication of the original theme of research). The weight one gives to the importance of the subject matter of research will be crucial in the decision to try to maximalise certainty.

Some possibilities to use strategic representativeness are:

a) Research of a prototype(s). This means that one investigates a characteristic representative of a group.

An example of investigating a prototype is Clifford Shaw’s study "The jack-roller: a delinquent boy's own story". In this book Shaw reports about the experiences of a juvenile delinquent, called Stanley by Shaw. During six years Shaw investigated the behaviour, the social environment and the criminal activities of Stanley.
b) Research by contrasting types (see Lafaille, forthcoming).

Jo Lebeer (1994) made a study of exceptionally brain damaged children. He investigated children who developed exceptionally better than medical diagnosis had predicted. He used this kind of knowledge to find out which principles are governing the modifiability of the brain. The empirical material showed a lot of possibilities to improve the situation of brain damaged children. In principle, such research can be complemented by investigating besides exceptionally positive development, its contrasting types: exceptionally negative development, cyclical development, stepwise development over long periods of time, etc. In the health sciences this type of research has been too less practised.

5. The relationship between validity, reliability and generalizability

Researchers are generally convinced that a negative correlation exists between the level of reliability and the level of validity of research activities (Boesjes-Hommes 1970: 65). With regard to this matter Gadourek (1967: 17) gives an interesting overview of the differences between the open interview and the standardized interview. An open interview leads to a rather high level of validity and a low level of reliability, whereas the standardized interview does exactly the opposite.

The idea that whether the reliability or the validity of certain research activities comes into question, may suggest that doing behavioural research must lead to a deadlock. If it is true that, during a depth interview (under the condition of controlled and repeated research activities), a positive correlation between reliability and validity is unreachable, biographical research will never be able to test a hypothesis or theory in an acceptable way. In this respect Plummer (1983) makes the following remark: “In life history research these two issues have been rarely discussed, perhaps because the problem of reliability is very hard to tap. Given that usually the virtue of life histories lies in the relatively free flowing babble of talk, to attempt standardisation of questionnaires is to invite invalidity. But without such standardisation and cross-checking, attacks become easy”. These sort of statements easily lead to a situation of stalemate and to a negative evaluation of biographical research. In our opinion a fair amount of the criticism is due to an redundant ideal of objectivity. In natural science it has already been accepted for many decades that not everything can be maximalised at the same time (See Heisenberg’s uncertainty principle, quantum mechanics, etc.). In the human sciences and in the health sciences one stagnates through an endless
discussion of principles concerning ideals of science. It is far better to look for solutions and learn to accept that absolute knowledge is inaccessible. We would like to propose that in every research one has to motivate systematically which elements (validity, reliability, etc.) will and which ones will not be elaborated c.q. controlled.

6. Threats to validity, reliability and generalizability

A scientific reconstruction can be distorted by various factors. We shall present a brief overview of the main threats that can occur during biographical research. We apply here general principles from the methodology of the human sciences (see also Cook & Campbell 1979; Segers & Hagenaars 1980) to biographical research.

a. Distortion caused by the composition of the research group
1) Even when a sample is drawn carefully, selections of research subjects are inevitable. It requires a lot of effort and motivation to be interviewed during many hours. For example, people who are demotivated, depressed or seriously ill are probably not so willing to talk to the researcher for such a long time. Furthermore, there is always the possibility of creating a statistical artefact, known as “regression to the mean”, as a result of focusing on certain subjects with certain (deviant) characteristics (Lafaille, 1996). Especially for the health sciences it is important that one bears this possibility in mind. As the result of the sampling method itself, an effect can be created that people with a serious condition can only become better and vice versa. This is a random phenomenon solely caused by selection procedures. It is rather difficult to control this phenomenon and it can lead to a considerable distortion of the research results.

2) Besides the problem mentioned above, there is the problem of “subject bias”. This is the case when the wrong people have been selected. For example, a vague description of the sample (e.g. what does it mean when one says that a patient is “depressed”?). This problem can be avoided by giving a good theoretical definition beforehand and by a careful selection procedure.

3) A factor that cannot be so easily controlled is known as “subject mortality”. This occurs when, during the research procedure, respondents unhook or, even worse, pass away. As biographical research normally stretches out over a rather long period of time, it is quite unavoidable. Therefore a “drop out and selection” study should be a standard procedure.

b. The influence of the interviewee

A research subject can have an influence in several ways:
- conscious manipulation or misleading for personal, legal, social or political motives. Therefore it is recommendable to carry out research into the authenticity and credibility of personal documents.
- lack (or severe disturbances) of self-observation.
- distortions caused by one’s own belief system or frame of reference.
- the influence of the unconscious.
- social influences, such as sexual or social taboos.
- failing memory.
- a bad state of health: bad eye-sight, bad hearing, etc.
- discongruence between verbal and non-verbal information. As this is often very difficult to observe it can easily lead to severe interpretation problems.

c. The process of observation
1) The length of time between a certain event and its reporting may be a threat with regard to the observation process (Denzin, 1978: 241). By reducing the period of time we will be able to control this problem.
2) The validity of biographical material can be affected by the effect of aging and fatigue of the respondent as well as the researcher.
3) The linguistic form. For example dialect can make the process of observation more difficult. But also a too symbolic language and translation problems with people from other cultures.
4) The theme can be touchy (for example, an assassination for political reasons) in a way that the researcher is hardly able to ask too invasive questions. Emotionally coloured answers are likely so that the level of truth has to be tested afterwards (what does it mean ‘I’ll kill him’ in the case of a political attack? Is it an expression of anger or a real intention?).
5) “Maturation”. By asking and repeating a lot of questions, the respondent can easily get accustomed to the questions. The answers are repetitive; the respondent will be able to remember his/her answers and will keep to them. The researcher will not be able to come closer to the “true” answer.

d. Interpretation process (secondary interpretations; see below)
1) The meaning of verbal expressions c.q. text has to be discovered. To obtain this the researcher must be able to have access to the world of experiences and the outlook of life from the point of view of his/her subject.
2) The researcher has to have a purely empathic contact with the inner world of his/her subject. This can be partly learned by training.
e. Analysing process (tertiary interpretations; see below)

1) The main threat of the analysing process is caused by using a wrong or less adequate theory.
2) 'Hineininterpretieren' (a vicious circle in the interpretation). The systematical observation and interpretation within a frame of reference which is chosen by the researcher.
3) The usage of too loose concepts. Concepts which are so extensible that they might be applicable to too many phenomena.
4) The phenomenon of 'statistical conclusion validity' has already been mentioned above. This problem is not only a matter of composition of the sample, but might also distort analysis.
5) If observation and interpretation reports are mixed up, distortion of observation can also appear after the interview had taken place. This can cause a systematic lack of methodological distance. Because of the interchange of observation and interpretation, the primary data - the interviews - will become inaccessible for other researchers.

f. Interactions between researcher and subject

1) 'Reactive effects' from researcher on his/her subject must be avoided. This problem can be controlled by making use of evaluations of previous interviews and systematically collecting research notes or registration by video or tape-recorder. If the researcher links his/her research notes explicitly to his/her analysis, he enables the reader to pass a judgement on this influence.
2) The interest of the interviewer as well as his frame of reference determine what is being asked and communicated and hence what is being observed. This shows that, even before the interview takes place, a selection appears.
3) During the interview the so called “observer-interference effect” can lead to unconscious manipulation. This is the case when the continuous interaction between the researcher and his respondent is being guided by implicit assumptions about the way one has to behave. Through this the observation is being pushed in a certain direction. This phenomenon will easily occur in a situation where someone takes over a formal observer role. Often the observer tends to interpret very quickly with the result that his subject tends to retract. Therefore it is very important for the observer to be conscious of this in order to avoid that only conclusions are drawn which are purely based on the researcher’s own thoughts. With regard to this matter Russell Jones (1977) points at the danger of self-fulfilling prophecy. This is the self-fulfilling prophecy is “a false definition of the situation evoking a new behavior which makes the originally false conception come true” (Merton 1948: 195)

1
case when the results of the observation are unconsciously twisted to be in accordance with what one expects to see. The Dutch psychologist Linschoten (1964) sees a further methodological problem in the sense that the psychologist observes that which he projects on his subjects (Lafaille, Lebeer and Mielants 1995: 3).

4) The influence of sympathy / antipathy from the side of the researcher and vice versa from the side of his subject.

5) The influence of (a lack of) empathical ability. This concerns the question whether one is able to fully understand another person’s way of living. It may be obvious that this requires a fair amount of life-experience and that this cannot be learned from books. The researcher must be able to create an atmosphere of confidence in a way that his conversational partner begins to feel comfortable and will not have the impression of being observed. The researcher has also to be open for that what the narrator has to say. Moreover the researcher should not take up a position of an authoritative person who knows everything. This can result in the fact that the narrator may withhold information.

g. Some more general characteristics of biographical research

1) There is a relationship with the type of biography (for more details, see Lafaille and Lebeer 1991). For example, there are differences between biographies which are written autonomously by the subject, autobiographies composed with the intention to publish and life stories which are told on request of/ or in consultation with the researcher. Each specific form of biographical material has it own problems of validity and reliability (this has been discussed in Lafaille and Lebeer 1991). If material is being used on which the researcher has had no influence whatsoever, other measures will hold with regard to the protection of validity. Biographies that are composed prospectively and biographies that are composed retrospectively will also differ with regard to validity and reliability.

2) In biographical research often various sources are used (interviews, letters, diaries, photos, etc.). Each of these sources has its own characteristics which may entail distortions.

7. Careful procedures during observation and interpretation

What can one do in order to prevent possible distortions of reality? In the next paragraphs we will give some suggestions, of how validity and reliability, during the process of observation and interpretation, can be improved in concrete biographical research. Other themes (like the drawing of samples) are not meant to be discussed.
For these matters we would like to refer to other publications (Lafaille, forthcoming).

Some general methods with regard to the whole process of observation are: (a) Careful and systematic observations and interpretations; (b) Careful reporting; separation of observation and interpretation reports (c) Systematically asking for feedback; (d) A critical review of sources and triangulation; (e) Acceptability of emotions both of subject and researcher; (f) Systematically reporting of the emotional life-world of the researcher. The latter makes it possible for third parties to check the objectivity.

Of course, it is also possible to apply both qualitative and quantitative research methods simultaneously. Stouffer (1980) has already drawn attention to this possibility. Data emanating from biographies (in which a certain attitude is being analysed) can be compared with the results of a questionnaire that can be presented to the writers of autobiographies. Furthermore, a number of biographies could be analysed independently by researchers (perhaps coming from various disciplines) working with different frames of reference, after which these analyses can be compared. The method that we will present here is based upon a systematic distinction between observation and interpretation. In the next paragraphs we shall, first of all, explain what is meant by this. After we have discussed the main threats that can occur during biographical research, in this paragraph, observing and interpreting will shown as a process of decision making. During this process numerous distortions can arise that may lead to an inadequate reconstruction of reality. Therefore we must be aware of bias of observation and of the so-called errors of the first and second order. In order to prevent those threats we have developed a model for both the observation and interpretation procedure. The models that we will present in this paragraph, which are based upon a systematic distinction between observation and interpretation, are illustrated with a number of flow charts. In those flow charts we have indicated a sequence of decisions which must lead to the rejection of a non-adequate reconstruction of biographical reality. With the help of those models we are able to deal carefully with our observation and interpretations in biographical research. This is necessary as opportunities will have to be offered to cumulate this kind of research by improving the aspects concerning validity and reliability.

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1 Triangulation in a general sense can be defined as follows: “It is a matter of everyday commonsense [...] that accounts of an event should be cross-checked against other independent accounts or evidence gathered by a variety of methods. The term triangulation is used in different ways, but essentially it refers to collecting and comparing different perspectives on a situation” (Stubbs 1983).
7.1 On the distinction between observation and interpretation

Elsewhere we have described at length the distinction between observation and interpretation and its implications for biographical research (Lafaille, Lebeer and Mielants 1995:14). Wittgenstein once said: “To observe something is to perceive something”, by which he meant that a lot of observations have an interpretative character. In a certain way observations can also be seen as interpretations. An ideal unbiased observation is unattainable. An absolute observation is not possible as the observation is part of a process of construction of reality that is fundamental and permanent: one constantly creates a total reality. An absolute distinction between interpretation and observation does not exist as we tend to observe interpretatively.

Nevertheless, for the practice of biographical research, it is useful to make a clear distinction between observation and interpretation. Because of the complexity, it is necessary to use a sophisticated terminology. Although one can choose for another epistemological starting point, we choose to distinguish between these two phenomena. It will be clear that observation and interpretation are always simultaneously present, but they have a different weight and accent according to the stage of the investigation. One can imagine the relationship as two communicating vessels: when one pushes at one side, the other side extends, and vice versa.

Observation then is a concept which refers to the direct communication between the researcher and the visible, sensory reality (external to him) which he investigates. Observation refers to a registration process in which the senses play a crucial role. Interpretation appears when these sensory perception experiences are put within a conceptual framework, however elementary this might be. E.g. this colour is "red" refers to a typology of colours.

If we take the factual process of biographical research as a point of departure, the following typology and distinction between levels can be very illuminating:
<table>
<thead>
<tr>
<th>Main classification</th>
<th>Sub-classification</th>
<th>Definition</th>
<th>Examples from biographical research</th>
<th>Validity</th>
</tr>
</thead>
</table>
| Primary interpretation or Observation | Primary interpretation of the outside or Observation on the primary (external) level. | Factual description of external behaviour in which no theoretical relations are traced which are not immediately given in the observed situation. | - S colours up.  
- S walks to the door (the relationship between S and the door is immediately evident)  
- S brushes when answering the first question fluff from her blouse  
- S says"......" | Face-value evidence. Can be checked by everybody. |
| | Primary interpretation of the inner side or observation referring to a secondary (inner) level. | Factual description of feelings and emotions of S in which no theoretical relations are drawn which are not immediately given in the observed situation, nor explanations given for the observed feelings and emotions. | - S cries and looks like feeling sad.  
- S seems angry about her father. | Validity can be checked by asking for feedback. |
| Secondary Interpretation | Description of the behaviour of the person which is still directly linked to the observed situation. Here, theoretical relations are drawn and explanations given for the observed behaviour. | - S feels how she is being pushed into the role of the ideal daughter.  
- S is always angry when she tells about her father. | Validity can be improved by analyses carried out by different researchers or by asking for feed-back (further interviewing). |
| Tertiary Interpretation | Focused on theoretical frameworks of complex interrelations between life events and the final construction of an overall picture, of a model of the structure of life of the interviewee. Tertiary interpretations are based upon systematic comparison of a very large number of secondary interpretations. | - S goes through a process of inner development from victim to mastery of his life.  
- S resolves an inner conflict between an authoritative father figure and the needs of the little child in her.  
- The permanent quarrels between the parents of S during the period of their divorce have generated in S a personality structure which makes S very vulnerable for scapegoat patterns. | Validity can be improved by scientific discussion and testing of new hypotheses. |

Table 3. Differences between observation and interpretation.
This table shows clearly that we will only talk about observation in the case of primary interpretations. It will also be clear that from primary to tertiary interpretations, there is an increase in the level of abstraction and linkages with scientific concepts. In observation all this remains implicit.

### 7.2. Awareness of bias of observation

An overview of the possible biases in the observation process is given in Table 4.

<table>
<thead>
<tr>
<th></th>
<th>phase 0</th>
<th>phase 1</th>
<th>phase 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>before the interview</td>
<td>during the interview</td>
<td>after the interview</td>
</tr>
<tr>
<td>interference by interviewer R</td>
<td>-selection of informants (the problem of who to interview) -selection of questions -choosing a frame of reference</td>
<td>-unconscious manipulation of the interview -non-verbal communication -sympathy/antipathy/ empathy -openness/closeness of consciousness</td>
<td>-hineininterpretierung -mixing observation and interpretation -precarious generalization -sympathy/ antipathy</td>
</tr>
<tr>
<td>interference by interviewee S</td>
<td>-acquaintance with interviewer -acquaintance with sort of questions and themes</td>
<td>-bad eyesight -lies -memory gaps -mincing matters -permanent re-interpretation -too much/not enough confidence in interviewer -perception of openness/ attitude of interviewer -perception of sympathy/ antipathy of interviewer</td>
<td>-feed-back on biographical report calls for new memories -re-interpretation -discongruence of observations of S and R (o_{S}≠o_{R})</td>
</tr>
<tr>
<td>inaccuracy of observation by R of S</td>
<td></td>
<td>-inattentiveness to non-verbal expressions (o_{R}&lt;e_{S}) -interpretation of i_{S} -too much/not enough empathy</td>
<td>-interpretation of the inside of S (i_{S})</td>
</tr>
</tbody>
</table>

Table 4. Possible bias of observation in biographical research

(S = interviewee; R = interviewer o = observation, i = interpretation, e = expression)
The process of observing and interpreting can be visualised by the following diagram:

![Diagram](image)

Figure 6. *The observation and interpretation process* (From Lafaille, Lebeer and Mielants 1995).

In each research reality is being observed through the filters of the applied frame of reference. Therefore it is important that the researcher explicates the frame of reference. By writing an observation report that is independent of the interpretations it will become verifiable by other researchers.

Not only the observation must be checked by others but also by the interviewer himself. This can take place if the interviewer asks himself questions such as: "How do I know this?" and "Is this an observation or an interpretation?". It is very important to compare the observations of the researcher with those from his subject with regard to congruence.

Conclusions that are purely based on the thoughts and ideas of the researcher must be avoided. It is very important to check if the observations of the researcher correspond with the experiences of his subject, in order to prevent that a non-adequate model (that is purely based on the fantasy of the researcher) is being accepted as a reliable and valid reproduction of reality. In other words: "are the observations congruent?"
Having looked at the preceding pages we must come to the conclusion that observation of biographical material is not an easy task. Numerous distortions can arise. However, this does not imply that a reliable observation of biographical material is impossible.

7.3. Observing and interpreting as a process of decision-making: errors of the first and second order

It has many advantages to look upon the interpretations of biographical research as hypotheses. This is hardly being done in daily research practice. We shall take here as an example a construction/image of reality at the level of observation (the patient is sad) and of a structure in the biography at the level of interpretation (the subject is developing from an uncommunicative person into an open, energetic and world-oriented individual).

Different from survey research, we will test each time not two, but three hypotheses:

- H₀ (zero hypothesis): There is no such image or pattern/structure. Reality shows a random character.
- H₁: A certain image/structure of reality holds.
- H₂ (alternative hypothesis): The image/structure deriving from H₁ is not an adequate reconstruction of reality. A different image/structure can be found in the biography.

A number of factors can arise that may prevent a correct observation report from being accepted as an adequate reconstruction of reality. These are factors which prevent a correct report from being acknowledged as such. Conversely, there are also factors which prevent an incorrect observation report from not being acknowledged as an inadequate reconstruction of reality. These two types of factors (in statistical language commonly called: errors from the first and second order) can be outlined as follows:
## ACTUAL SITUATION

<table>
<thead>
<tr>
<th>DECISION</th>
<th>H₀ is correct</th>
<th>H₁ is correct</th>
</tr>
</thead>
<tbody>
<tr>
<td>reject H₀</td>
<td>incorrect decision (α-error)</td>
<td>correct decision</td>
</tr>
<tr>
<td>accept H₁</td>
<td></td>
<td></td>
</tr>
<tr>
<td>accept H₀</td>
<td>correct decision</td>
<td>incorrect decision (β-error)</td>
</tr>
<tr>
<td>reject H₁</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 5. *Errors from the first (α) and second (β) order.*

Analogous tables can be constructed to show the relations between H₀ and H₂ and between H₁ and H₂.

In the case of observation, an error of the first order (alpha-error) can occur in the following situations:

a) The subject may have 'blind spots'. These spots concern matters of which the subject is not aware and which he cannot observe; the inability of reflecting on his own situation because there does not exist enough time (and distance) between the events and the assimilation. Because of this, congruence will never occur.

b) We can also be dealing with subjects who will react contradistinctively to the observations of the researcher. These persons will never agree with the researcher.

During observation an error of the second order (beta-order) can occur in the following situations:

a) A number of factors can appear that will cause deviations with regard to the observations of both subject and researcher.

b) Complete congruence of the observation reports can appear if we are dealing with subjects who are “exceptionally” dependent on the researcher (these people assume that the researcher has all the knowledge).

c) Furthermore, interactions may appear in which complete congruence is systematically being created. For example, an extremely harmonic relation between researcher and his subject in which both highly enjoy mutual agreement.
d) The problem of 'double description' may cause interference too. Inevitably, the observer finds himself in an essentially different position from his subjects. Because of this, suspicion should arise if there is full congruence.
e) 'Hineininterpretieren' may also lead to full congruence.

For the interpretation reports, one meets an error of the first order (alpha error: a true interpretation report is rejected) when:

a) and b) : Similar as the in case of observation (see above).
c) The veracity of the interpretation report is questioned by the interviewee because the confrontation with it is too painful.
d) The legitimacy of the interpretation report is questioned by the interviewee for reasons mentioned before in a, b or c, although different investigators - at first with identical frames of reference, and later with different frames of reference - came to similar conclusions.
d) The situation mentioned in d, appears in case of a subject matter which is dependent upon the frame of reference.

An error of the second order will appear in the interpretation reports (beta - errors: a false interpretation is regarded as a valid representation) when:

a) one deals with research bias due to which all interpretations are considered to be valid. Characteristics of the relationship between researcher and interviewee can be influential here, like e.g. in the case of highly emotionally dependent subjects.
b) a problematic is met which is highly dependent upon the frame of reference which is used, and when no other researchers are consulted.
c) ‘hineininterpretieren’ is present.
d) a lack of empathic abilities from the side of the investigators block adequate interpretations. This is more a theoretical possibility. In practice, it will not so easily occur that when new researchers are added, discongruence of interpretations will remain.
e) insufficient operationalisation or insufficient indicators give distortions in the study. When all steps as proposed in the flow diagrams (see below) are systematically carried out, deficiencies in indicators will show themselves relatively easy, and corrections can be made early in the research process.

1 'Double description' refers to the fact that there is, on the one hand, an objective view that arises from the observations made by the researcher, and on the other hand, a subjective view which is connected with the life-world of the interviewee.
7.4. A model for the observation procedure

7.4.1. Introduction

With the claims made above as a starting point, we have tried to develop a solid procedure for the observation of biographical material. This procedure is shown in the following model. With the help of this instrument (of which there does not exist an equivalent in current biographical research, as far as we know) we are able to deal with the problems regarding observations of biographical material. With this instrument it is also possible to obtain findings which can be criticized and controlled by other researchers. As a central methodological rule it grants that, in general, one should strive for congruence between the observation report of the researcher and the recollection of the interview by his subject. By this rule we want to maximize the chance of “hineininterpretierung”, a danger which we suppose to be much greater than the danger of false congruence. There are, however, exceptions, like for instance patients with serious psychological disorders or interviews during which one is asked about social taboos. Each time it must be pointed out where discongruence appears and why and to what extent one can speak of a deviation. In the case of discongruence a separate analysis must be carried out. The possibility of being - consciously or unconsciously - misled must always be considered. In the next three paragraphs we will consider several hypothetical situations that may occur during the process of observation.

7.4.2. A situation of full congruence

In an hypothetical ideal situation, although theoretical possible, all observation reports are congruent. This is the case when there are no differences between the observation reports of the researcher and the life-world experiences of his/her subject. It will be clear that one always has to check if no interfering factors are operating. If this situation occurs one can say that the observation report can be accepted as an adequate reconstruction of reality. The flow chart shown below illustrates this:

---

1 One can treat the choice of a methodological rule as creating a situation with it’s own alpha- and beta-errors too.
7.4.3. A random situation

It is also possible that a significant number of reports are congruent. According to the statistical error standards we can say that if more than 95% of all reports are congruent (and therefore less than 5% of all reports are discongruent) we may use a “random” model in which deviations (between confidence limits) are allowed. When using the random model we still have to ask ourselves whether the variations really reflect a random distribution (a normal distribution). If so, we can speak of random fluctuations and the observation report can be accepted as an adequate reconstruction of reality. If further investigation is required, the steps to be taken then are explained in the next paragraph. The situation described here is shown in the following figure:

Figure 7. A situation of full congruence.

Figure 8. A random situation.
7.4.4. Other possibilities

If none of the situations, as mentioned in the previous paragraphs, occur we will have to consider alternative possibilities. Even if more than 5% of all reports are discongruent we may (under circumstances) come to the conclusion that there is still a random fluctuation so that the observation report of the researcher can be interpreted as an adequate reconstruction of reality. This is the case when, even after adding more researchers, discongruence remains and the variations do show a normal distribution.

![Flowchart: Random fluctuations](image)

Figure 9. *Random fluctuations.*

However, if the discongruence disappears we can presume that we are dealing with an inaptness of the researcher and therefore will have to replace him/her.
A problem that can not so easily be dealt with is the bias caused by the respondent (and the possible interaction with the bias caused by the observer). Therefore we will have to investigate if the bias is systematical.

Bias caused by the observer can partly be caused by the used frame of reference. By adding other researchers with different frames of reference we are able to control this problem. If the discongruence disappears we can conclude that the problem of discongruence is dependent on the frame of reference. If no further research is desired as we may be dealing with a special category of problems or even a disturbed selection of respondents.
7.4.5. Complete procedure for the validation of observation reports.

By adding the previously explained flow charts the following figure appears:

Figure 12. Further investigations.
Validity & Reliability

O₁ = O₂
Both reports are congruent

Interfering factors are checked (see text)

Use of random model
(deviations allowed as long as they remain within confidence limits)

Discrepancy remains?

Do the variations show a normal distribution?

Yes

Random fluctuations

Further investigation required

No

Discrepancy disappears

Discrepancy disappears

Does the discrepancy disappear by adding other researchers using other frames of reference?

Yes

Special category of problem?

Further research desired: standard solution is not possible

No

Conclusion: presumable incompetence of the researcher

Replacement of the researcher

Possible causes

Bias caused by the respondent

Bias caused by the observer

Possible interaction

Systematic bias?

Unreliable respondent

Validity & Reliability

The observation report of the researcher is an adequate description of reality

Legend:

O₁ = observation by the respondent

O₂ = observation by the investigator

Figure 13: Procedures for the validation of the observation reports
7.5. A model for the interpretation procedure

7.5.1. Introduction

Although sometimes analyses are made without a theoretical frame of reference, usually a theoretical frame of reference is used for the interpretation of interviews and other biographical material. There are lots of frames of references that are well suited for the explanation of biographical processes and developments. Moreover biographical research can be practised in various scientific disciplines.

An advantage of a frame of reference is that it offers a clear framework for the study of events. It delineates a scientific object. A disadvantage is that only that is being observed which falls within the frame of reference. This can cause the danger of 'hineininterpretieren'.

We formulate here a methodological rule of congruence on two levels:

a. mutually between different researchers;
b. between the researcher and his subject.

ad a. Congruence between researchers

On this level congruence cannot so easily be obtained, definitely not because reality can be interpreted from various points of view (Lafaille 1992) and therefore it is not wise to pursue complete congruence. Different interpretations will stimulate the scientific process of research and are at the core of scientific developments. In the health sciences, nevertheless, it might be a valid aim to strive for knowledge which is as independent as possible of specific frames of reference (Who, for instance, would accept the fact that the effect of a medicine against cancer would be dependent on the researcher’s frame of reference?). Within the proposed flow chart (see below) there is room for these matters. In some cases the decision can be based on statistics. Quite evidently, discongruences must be reported in detail.

It must be noticed that it can happen that researchers, with the same frame of interpretation, may come to discongruent findings with regard to their interpretations. The correspondence depends on:

- The number of cases of interpretation: if there are a lot of interpretations to be made, the chance of full correspondence decreases.
- The number of categories of interpretation: if there are a lot of categories, there is less chance of correspondance.
- The definitions of the categories: if the categories are well defined/indicated, there is more chance of correspondance.
- The training of the researchers: if the researchers are trained to deal with the specific problem there is more chance of correspondance.

ad b. Congruence between researcher and subject

Concerning the congruence/discongruence between researcher and subject one has to take into account the difference in frames of interpretations: a lot of respondents are not familiar with the scientific jargon and therefore a suitable field approach has to be developed (Lamnek 1988:125).

After the remarks mentioned above, we can ask the question when an interpretation report may be considered an adequate reconstruction of reality. In the following flow charts we have tried to indicate a sequence of decisions which must lead to the rejection of a non-adequate reconstruction. The problem of ‘hineininterpretieren’ will be controllable. In our model the congruence between researcher and subject has priority. In a second step the congruence between the researchers is used as a criterion. This sequence corresponds closely to the practice of biographical research. However, congruence is not always possible and in these cases specific measures must be taken (for instance: triangulation by researchers). We assume here as a starting point the congruence between researcher and subject with regard to the observation reports, to avoid as much as possible the possibility of “hineininterpretieren”. The acceptance of the report by the respondent can either be high or low or in the worst case even be rejected. In the forthcoming paragraphs we will take a look at these situations. The sequence of decisions are illustrated using a number of flow charts.

7.5.2. Interpretation as an adequate description of reality.

When there is full congruence between researcher and his subject concerning the acceptance of the interpretations, we have only to check if interfering factors are operating. If this is not the case the interpretation report may be accepted as an adequate description of reality.
Figure 14. A situation of full acceptance.

7.5.3. A situation of low acceptance or rejection

If, in contrast with the situation mentioned above, the acceptance is low or the interpretation report is rejected, we have to check if there is a possibility of bias of the researcher or if the used explanation model needs adjustment. The latter situation can be illustrated as follows:
If the operational model has been adjusted (or does not need any adjustment at all) and the problem of lack of acceptance remains, we must ask ourselves if perhaps the researcher is biased. To verify this we have to add a second (or even more) researcher(s) using an identical frame of reference. If, after this addition, the acceptance of the report by the respondent is high, we may conclude that we are dealing with a presumable inaptness of the initial researcher. Therefore s/he will have to be replaced. In the next flow chart the sequence of these decisions is drawn:

If however, the acceptance remains low or the interpretations are totally rejected the problem may be dependent on the used frame of reference. To verify this, we have to add other researchers with different frames of reference and look if the acceptance remains low. If so, a standard solution is not possible. If this is not the case, the problem is probably dependent on the frame of reference. This situation is shown in the following figure.
7.5.4. Complete procedure for the validation of interpretation reports

If we unify the previously shown flow charts, the following figure is composed:
Figure 18: Procedures for the validation of the interpretation reports
8. Statistical testing methods

The determination of the validity and also of the reliability of observations and interpretations can take place by measuring the intersubjective correspondance between researchers. This can be done by using a simple index of consistence (Van de Sande 1984: 74) or by using more advanced statistical tests (Cohen’s Kappa, D2). For these tests we refer to the statistical manuals and a computer program such as e.g. AGREE.

9. Conclusions

In this text we have explored the topics and problems regarding validity and reliability in biographical research as used in the health sciences. We have noticed that those themes are crucial in the development of a more adequate methodology for this type of research. After we have shown in which way biographical research can help to clarify a number of questions in the health sciences, we started with a look at the underlying conflicting views about science by reviewing its fundamental concepts and the implications for the methodology of biographical research. The crucial themes in the development of an adequate methodology - validity and reliability - and their relationship have been discussed and refined.

After a brief overview of the main threats that can occur during biographical research, observing and interpreting are presented as a process of decision making. During this process numerous distortions can arise that may lead to an inadequate reconstruction of reality. In order to prevent those threats we have developed a model for both the observation and interpretation procedures. The models that were presented were based upon a systematic distinction between observation and interpretation. With these models we have indicated a sequence of decisions which must lead to the rejection of a non-adequate reconstruction of biographical reality.

We have noticed that we are able to deal carefully with our observations and interpretations in biographical research. We hope that the quality of biographical research will be improved by using the research procedures as proposed in the flow charts. This is necessary as the definitions of problems in the health sciences have clinical implications and it may be evident that a high level of certainty is pursued. The systematic division of observations and interpretations offers a new opportunity to cumulate biographical research, because observation reports can easily be reinterpreted by other researchers with these procedures.
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